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SOME SERIOUS PLANT DISEASES IN WESTERN AUSTRALIA WHICH ARE BROUGHT ABOUT BY UNUSUALLY HIGH TEMPERATURES.

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THE MEANING OF THE TERM "DISEASE."

Before one can appreciate the special importance and significance of those non-parasitic diseases of plants which are associated with periods of unusually high temperatures, it is necessary to have a clear-cut idea of just what the plant doctor, or, as he is generally called, the plant pathologist, means by the term "disease." To him the word "disease" has a very much wider meaning than that in which it is generally employed.

Thus, in the sense in which the word will be used throughout this article, disease may be defined as, "any condition of a plant, quite irrespective of its cause, which tends to reduce its vigour, or to shorten its life, or to detract in any way from the quantity or quality of the yield which might reasonably be expected under ideal conditions." In a shorter and more simple manner we may say that disease is any condition of a plant which falls short of perfect health. Perfect health results only from the inter-action of perfect heredity and ideal environment, a requirement which is seldom if ever fulfilled, at least for any considerable length of time.

Heredity may be regarded as determining the possibilities or potentialities of any organism, while environment determines whether those potentialities shall become actualities, wholly, in part, or not at all. To the extent that the innate possibilities are not allowed by the environment to be fully expressed, the plant may be considered to be diseased.

CAUSES OF PLANT DISEASE.

Plant diseases may be brought about either by living, or non-living causes. Those diseases which are caused by attack on the plant by some other living organism, or parasite, are known as *parasitic* diseases. All the others are grouped under the heading of *non-parasitic* or *physiological*, as they are due to some deranged physiology or functioning of the plant.

SOME COMMON PARASITIC DISEASES OF PLANTS IN W.A.

Some examples of *parasitic* diseases of plants in Western Australia which can only be mentioned in passing, are the "powdery mildew" or "oidium" diseases of roses, hydrangeas and grapes; "rusts" of wheat, geraniums or carnations; "bacterial blights" of walnuts, mulberries and French beans; "Fusarium wilts" of tomatoes, pumpkins and asters; "spotted" or "bronzy wilt" of tomatoes, tobacco, iceland poppies, ranunculi and anemones; "downy mildews" of onions, lettuce and tobacco; "brown rot" of oranges, mandarins and lemons; "anthracnoses" of grapes, loquats, and navel oranges; "black spot" of pears; "shot hole" of apricots, peaches, almonds and plums, and "powdery mildew" of apples. These are all diseases brought about by attack on the plants by specific parasites, which gain their own nefarious livelihoods by attacking and living on the tissues of the particular plant species concerned.

Some of the most common parasites are bacteria, fungi, slime moulds, eelworms, insects, or even certain flowering plants, such as "broom-rape" which occurs very commonly in the metropolitan area, living on cape weed, clover, and so on; "dodder," which attacks lucerne and clover, etc.; "mistletoe," which parasitises the native eucalypts, or the much-admired Christmas tree (*Nuytsia floribunda*), which lives as a parasite on the roots of practically any kind of plant growing within its reach.

NON-PARASITIC PLANT DISEASES.

Some examples of *non-parasitic* diseases are the "Grey Speck" disease of wheat and oats, which occurs in this State on those soils where, in certain seasons, there is a deficiency of available manganese in the soil; the "die-back," "gumming," or "Exanthema" disease of orange trees, which appears to be brought about by a deficiency of copper, and which can be prevented or cured by the application of powdered bluestone to the soil, or by routine spraying with Bordeaux Mixture; "Streak" or "Stripe" disease of sweet peas or tomatoes, which is induced by over-liberal manuring with nitrogenous manures and insufficient use of sulphate of potash; "Yellow Berry" disease of wheat, which is due to a deficiency of available nitrogen in the soil; and "Sour Sap" or die-back of apricots and other stone fruits, which often results from inadequate drainage. A further very clear-cut example of a non-parasitic disease is "frost injury" on wheat, which was very much in evidence on wheat heads, leaves, and even stems, in this State, during 1932.

CONDITIONS FAVOURING PARASITIC AND NON-PARASITIC DISEASES.

Parasitic diseases, for the most part, require warmth and abundance of moisture in the atmosphere for their successful development, so that they are mainly in evidence in this State during the *warmer months of the wet period* of the year, or in those places where plants are grown during the summer under irrigation, especially if this is of an overhead type, such as by the use of sprinklers.

On the other hand *non-parasitic* diseases are most abundant during the very hot, dry, period of the year, and it is with those diseases that are associated with periods of unusually high temperatures that this article is concerned.

INJURIES TO FOLIAGE DURING HOT SUMMER WEATHER.

One of the best known examples of a non-parasitic disease in this State is the burning back of the edges of the leaves of loquat and plane trees, grape vines, wistaria and virginia creepers, and so on, during periods when the root system is

unable to absorb water from the soil as fast as it is being lost from the leaves, under the influence of the hot, drying, winds of summer.

The way in which this is brought about is as follows:—All plants require, for their successful development, comparatively large amounts of certain mineral substances such as nitrates, potash, phosphoric acid, lime, iron, magnesium, and so on, which only exist in minute quantities in the soil solution, which occurs around the soil particles in the form of a thin watery film. It therefore happens that to obtain sufficient quantities of these necessary dissolved substances, the plant has to take in a very much greater quantity of water than, under normal conditions, it requires for other purposes. This excess water, which the plant normally cannot utilise, must be given off in some way, and the mechanism for this is provided by minute openings known as breathing-pores, or *stomata*, which exist in thousands on the top, or bottom, or in some cases both sides, of the leaves. Through these tiny openings the excess water is given off into the air in the form of invisible vapour, in much the same way as water is lost from the surface of a pond, or a bucket of water left out in the sun. No water can be seen coming from the pond or the bucket and yet the water level, by evaporation, slowly becomes lower and lower. No water can be seen coming from a wet sheet hung out on a line to dry, and yet it obviously does pass from the sheet into the air and so away. Now it is a matter of common knowledge that the hotter and windier the day the more rapidly does the water in the bucket or pond evaporate and the sheet become dry, and precisely the same thing happens in the case of the plant. The only difference is that the plant is provided with a means of water intake where the bucket, pond and sheet normally are not. Some attempt may be made by the plant to close up the breathing-pores, but this is rarely very effective. The absorption of carbon dioxide gas for the manufacture of sugar, starch, and other necessary food substances, and the necessity for rapid respiration (breathing), require that the breathing pores be left open, to some extent at least; so that the plant finds itself, so to speak, on the horns of a very awkward dilemma. With an increase in temperature, therefore, especially if accompanied by strong winds, the rate and amount of water being lost from the leaves tends to become ever greater and greater. This means that the roots are obliged to absorb and pump more water to the leaves, in a given time, that under normal conditions. If they are unable to accelerate their absorbing and pumping action sufficiently, a condition of water deficiency in the plant must obviously ultimately ensue. Thus we may find that the leaves become more or less rolled up around the mid-rib, they may tend to hang vertically instead of remaining approximately at right angles to the direction of the sun's rays, and the plant may take on a more or less badly-drooping or wilted appearance.

An important point to observe is that this will occur more rapidly on a moist sandy soil, especially if deficient in humus, than on a moist loam or clay, and it very frequently occurs even when the soil contains abundance of moisture, as *it is not the total amount of water in the soil, but the amount which the roots are able to absorb in a given period of time, which is important.* Very hot periods following suddenly after comparatively cool ones cause a lot more trouble than a long drawn out, but gradual, increase in temperature.

If the root system is unable to absorb water as fast as it is being lost from the leaves, one or other of two things must happen, viz.:—either those portions of the leaves or shoots which are most remote from the source of water supply (the roots) must dry out more or less completely, or alternatively some other portion of the plant must be sacrificed in an attempt to balance the water loss through the leaves with the amount of water intake through the roots.

Thus we frequently find edges of grapevine leaves, loquat and plane tree leaves, for example, burning back from the edges, or in between the larger veins, during periods of very high temperatures, especially if accompanied by strong easterly or other drying winds. Older leaves are frequently sacrificed to keep the younger ones at the ends of the branches from being injured.

REPRODUCTIVE PARTS ARE OFTEN SACRIFICED IN THE INTERESTS OF THE LEAVES.

Where fruits or flowering structures are present these may be sacrificed wholly or in part to keep the leaves alive.

Thus in the case of wheat plants coming into flower during periods of hot drying winds, water may be drawn back from the ears by the leaves, so that the male and female parts of the flower are dried out, and the delicate act of fertilisation which is necessary for the formation of each individual grain cannot take place. Even if weather conditions should soon become propitious, there is no

Fig. 1.—Wheat heads, showing the effects of hot, drying winds at, or about, the flowering period. The head on the extreme left is normal, that on the extreme right completely whitened and empty; all the others are "tipped," *i.e.*, whitened and free from grain for a greater or less portion of the terminal part of the head. Wind injury never occurs at the middle or base of a wheat head without also similarly affecting all the more terminal portions of the head, whereas frost injury often does. This feature is often of considerable diagnostic value in distinguishing wind injury from frost injury. (See Leaflet 379, or this Journal for June, 1933, pages 286-291.)

—*Photo. by author.*

second chance, and many individual potential grains, which might have been formed, have been lost to the world for ever. On sand plain country, especially if newly cleared, it is common for every flower in an individual ear to fail, so that frequently at harvest time many of the heads may be found to be quite devoid of grain; whereas on heavy country adjoining, very few, if any, of the heads may be completely empty, but many may be "tipped," that is to say, whitened and free from grain at the tips of the ears only. This trouble is usually referred to as "Wind injury" of wheat heads. (See Leaflet 301, or this "Journal" for March, 1930, pp. 153-164.)

The backward withdrawal of water by the leaves from the young fruits of orange and other fruit trees during periods of very high temperatures, is frequently the unsuspected cause of a very heavy dropping of these fruits up to several months after setting. Indeed oranges cannot be considered safely set until they have attained the size of walnuts. This falling of young orange fruits is very common in the month of June in orange groves in California, from which fact it has come to be known there as the "June drop" of Washington Navel oranges.

INTERNAL DECLINE OF LEMONS.

Well-grown lemon fruits frequently suffer during heat wave periods from a condition known as "Internal decline." The interior of the lemon fruit becomes more or less dried out, especially towards the nipple end and to one side of the central axis. The dried-out tissues frequently have a strongly fermented smell, and a certain amount of gum-like material may be formed inside the dried out areas of the pulp and peel. The flavour of the juice remaining is often very detrimentally affected, and the fermented smell is sometimes so pronounced as to be detected without cutting open the fruit, the outer appearance of which may be in no wise altered, although fruits affected while green often show an orange-yellow colour near the nipple end.

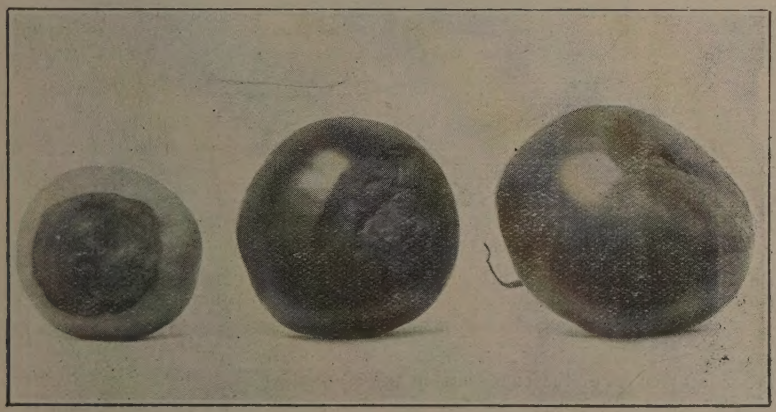

Fig. 2.—Blossom-end rot of tomatoes.
—*After W. M. Carne, this Journal, March*, 1926, *page* 22.

BLOSSOM-END ROT OF TOMATOES.

A collapsed brown or black area on the "blossom end" of tomato fruits is frequently met with in this State during very hot periods, and is known to growers as "blossom-end rot" or "black spot" of tomatoes. Although these collapsed areas

sometimes become infected with parasitic organisms, the origin of the affected areas is physiological, and similar to that already noted in the case of "wind injury" of wheat heads, or "internal decline" of lemons.

Similarly the plant troubles known as "Blotchy cork" (or sometimes, erroneously, "Bitter Pit") in Cleopatra and other varieties of apples while still attached to the trees; "internal brown spot" or "fleck" of potatoes; and a collapse of grapes especially prevalent on the shoulders of the bunches which is known to many vignerons as "windsuck"—are all brought about by the withdrawal of water from the affected portions of the plants, by the leaves, during periods when the drying power of the air is so great that the water-absorbing powers of the roots prove insufficient to pass water through the plant as rapidly as it is being lost by "evaporation" (transpiration) from the leaves. Hard lumps, which become especially noticeable after cooking, may also be similarly induced in swede turnips or pumpkins.

Fig. 3.—Blotchy Cork on Cleopatra Apple.
—*After W. M. Carne, this Journal, December,* 1928, *page* 376.

"WATER CORE" AND "HEAT CRINKLE" OF APPLES AND OTHER FRUITS.

Two other troubles which are very common in this State during heat-wave periods are "water core" (or "glassiness") of Dunns, Democrat, Granny Smith, Rome Beauty, Jonathan and other apple varieties, and "heat crinkle" of Rome Beauty and Apple of Commerce, etc., apples, and also of Kelsie and other Japanese plums. In both of these cases there appears to be a certain amount of injury brought about by the backward withdrawal of water from the fruits by the leaves, but the major cause of the condition, in these cases, seems to be a premature conversion of the starch in the immature tissues to sugar, under the influence of very high temperatures. Under very high temperatures an amount of starch conversion which would normally require several weeks to eventuate may take place in a few hours. The result is that the sugar concentration of the tissues becomes abnormally high. At night, when the roots can frequently absorb all the water required by the above-ground parts without difficulty, the tissues with the abnormally high sugar concentration have to absorb so much water to sufficiently dilute the sugar that the water overflows from the cells and the tissues become waterlogged. Following on this a number of further diseased conditions, such as the formation of

"crinkle" (so-called "confluent bitter pit"), "water-core breakdown" and so on, may result from the gradual suffocation, death and drying-out of the cells and other associated abnormal physiological processes.

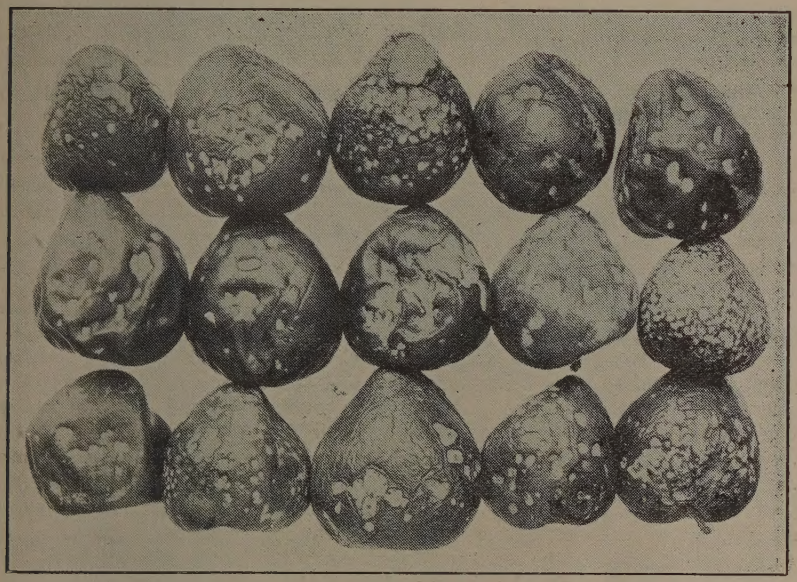

Fig. 4.—Heat Crinkle on Kelsie Plums. This physiological trouble is a direct result of heat wave conditions.

—Photo. by author.

MITIGATION OF INJURIES TO PLANTS BROUGHT ABOUT BY HEAT-WAVE CONDITIONS.

It has been found that all the diseases of plants which are due to unusually high temperatures may be mitigated, if not entirely prevented, by the employment wherever practicable of windbreaks; by the use of sprinklers or some other suitable device for increasing the humidity of the air during critical periods; by the incorporation of loam or clay and an abundance of humus-forming materials into sandy soils; by the liberal use of superphosphate to encourage abundant root development; by the liberal use of sulphate of potash to build up drought and heat resistance; by the thorough compaction of sandy or "sand-plain" soils before sowing wheat or other crops; by the use of only the minimum necessary amount of nitrogenous manures or fertilisers (as these encourage the formation of an excessive proportion of leaf surface to reproductive structures); by judicious summer pruning to remove excess foliage; and by a type of winter pruning which will not lead to excessively vigorous vegetative growth during the following summer.

Wherever possible, water should be applied in liberal quantities during heat-wave periods, and preferably from the windward side by the use of sprinklers. At other times watering should be heavy but only at infrequent intervals, so that deep rooting will be encouraged and the soft, succulent, forced foliage growth which will prove a detriment under heat-wave conditions, will not ensue.

DUCKS.

G. D. SHAW,
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PART I.

This series of articles will explain the common practice of breeding ducks for flesh and egg production. The breeds to be considered will be:—

1. Muscovy.
2. Indian Runner.
3. Khaki Campbell.
4. Pekin and Aylesbury.

MUSCOVY.

This breed is a native of South America. It is considered to be a distinct species and not a descendant of the Mallard or wild duck.

There are two varieties—white and black—which are alike except for their plumage, the white variety being pure white and the black variety a mixture of black and white. Crossing the white and black varieties produces a bird of mottled blue plumage. The white variety is the one to breed, as its colour enhances its value in the market. Owing to the small number of eggs they lay, muscovy ducks are of little value for egg production, their main use being for table poultry and then only when they are young. As they age, the flesh takes on a musk flavour. Muscovy ducks have a semblance of a crest which they can elevate or lower at will. As they reach maturity the faces are bright red similar to the caruncle of turkeys.

Sexes are distinguished by the size of the birds and tone of their voices The drake, besides being larger than the duck, has a marked red projection on the base of the bill. Drakes average between 10 and 12 lbs. each and ducks 6 to 8 lbs. each.

They may be crossed with other species of ducks, but the progeny is a hybrid that cannot reproduce.

One vice they have is that they are good fliers. It is no unusual sight to see a muscovy duck flying around the farmyard.

Mating.

When selecting a breeding pen of muscovies take care the males are unrelated to the females. Quick growth with size is desired and nothing is more prejudicial to those attributes than inbreeding or close breeding. Allow one drake to five to seven ducks. The females are better as breeders during their second, third, and fourth years; often one experiences the trouble of infertile eggs from the first lay of first year birds, and for that reason alone it is not advisable to mate young ducks. The age advisable is a two-year old duck to a 12 to 18 months' old drake.

The duck in the second year will lay from 18 to 23 eggs, sit, brood and lay again for three sittings. Seasonal weather may allow of more sittings being obtained.

As the duck can climb fences it is advisable to cut one wing.

Housing.

One of the attractions to duck raising is the small amount of capital required. Generally speaking, the housing can be of a primitive nature so long as the ducks have access to dry floors when they retire at night. Ducks are hardy birds but dampness is fatal if the ducks cannot get away into dry quarters.

The yards may be fenced with material no higher than three feet, but always provide a breakwind on the weather sides; ducks do not like cold winds.

Allow the breeders plenty of exercise. When mated the ducks select their own nest, which can be any box with an open front (a barrel, cut in four, makes a good nest).

Breeding.

They will lay their eggs in the nest of their choice and cover the eggs daily with the down they have deposited. On finishing the lay they sit excellently, coming off daily for a feed and bath. While feeding, one will notice that they have again covered their eggs with the down.

After the duck or ducks in the pen have settled down to their hatching, remove the drake. He has a habit of drowning the young hatched ducklings if given a chance.

Test the eggs for fertility after seven days, and should two or more ducks be setting at the same time it may be possible to transfer the fertile eggs to fewer ducks and reset those deprived of their eggs or allow them to get over their broodiness and start laying again. The period of hatching a muscovy is 35 days. Do not disturb the duck or she may desert her nest.

Brooding.

The simplest and most advisable way of weaning is to allow the ducks to rear their own young. It is found that the duck has a cycle of operations, i.e., laying the eggs, setting, brooding and laying again, and very little advantage is gained by disturbing the cycle through taking away the ducklings.

Of course for those contemplating duck breeding in a large way, the time and labour saved justifies artificial brooding and rearing. They require less heat than chickens, 85deg.. being sufficient, and can safely be left to themselves without artificial heat after two to three weeks, according to the weather.

Feeding.

The same practice in chick feeding is found possible with muscovy ducks, except that grain is not given at evening meal. Feed hourly the first two weeks with a mash of 4 bran, 4 pollard, ½ meatmeal, ¼ bonemeal, 1 oilcake and 1 per cent. salt and chopped greens added, or use 5 bran and 3 wheatmeal in place of the pollard and bran—bulk measurements. Greens can be up to 50 per cent. in bulk of mash. Increase the periods between feeds as they get older but do not stint the food. The aim is to put on flesh quickly. Use plenty of milk if available.

Plenty of shell grit, and water must always be available. Ducks consume an enormous amount of water and grit, and any failing in the supply of either is detrimental.

The water troughs for young and old must be deep enough for them to bury the head under the water.

As the flight feathers begin to grow, feed on a fattening diet. Any, of course, which show excessive condition and size and are required for future breeders should not be fed a fattening ration, but kept on a growing ration and given all the exercise possible.

To change from the growing ration given above to a fattening ration, lower the proportion of the meatmeal and bran by half and add more wheatmeal or more pollard.

Have plenty of water available because the ducks always drink after each mouthful of food.

The less exercise they get at this fattening period the better. Latest practices are to confine the ducks on slatted floors in coups with slatted sides—feeding through the sides of the coup. The enclosure is raised to facilitate feeding and cleaning and as many ducks as possible are placed inside, while allowing for sufficient room to approach the food. The sexes should be separated as soon as possible.

At about 10 to 12 weeks old the flight feathers of the duck will have about *crossed* at the back near the tail. This is the one and only time the duck is in prime condition for marketing, it having produced its first feathers (which will now start to moult) and yet not having begun to grow the next set. A week later is too late, the body will be covered with stubs which are a distinct disadvantage to dressing and the condition of the bird now falls away. For drakes the period is from 14 to 16 weeks of age.

The foregoing is the most important part in marketing after one has obtained weight with a good fleshed condition.

Handling.

When handling the muscovy one must be careful of their strong legs, feet and pointed claws. Other ducks are caught by grasping the neck but with muscovies the safest method is to force the bird to the ground by placing the hand on the back, grasp the wings close to the body and carry the bird in that manner. Any other way is dangerous.

Diseases.

Although muscovies are hardy they can suffer from disease with other fowl. Care in management is just as essential to success also.

Heat causes havoc with ducklings. If one is using an incubator, losses may be suffered because the heat is allowed to rise too high. Never let the temperature reach 103 degrees, and after hatching see that the crowding does not cause excessive temperatures. As muscovies are seldom hatched in incubators this trouble need not be considered seriously.

Staggers.

Symptoms: Queer head movements, running in circles, lack of control of muscles, and ducklings on their backs kicking their legs. Death occurs quickly. No cure.

Staggers may be caused by sunstroke, water before food in the mornings, lack of water, warm water, and cold water given after being in a hot brooder over night.

Young ducklings cannot stand sun until their heads are covered with feathers. It is safe to keep them continually in a shady run or house until seven to eight weeks' old, as the slightest ray of sun on a duckling will cause staggers.

Always leave the front of a brooder open to allow the young ducks access to food and water during the night. The practice of enclosing them in a brooder over night and then releasing them in the morning for a feed is dangerous, but if for some reason it has been necessary to closely confine them during the night without food and water, see that they partake of food before they gain access to water. The water must not be too cold.

"Sweaty" Eye or Running Eye.

These symptoms are due to chills, colds, catarrh, and the water dishes not being deep enough.

If due to shallow water troughs the remedy is obvious.

Colds, etc., may be cured by the application of Condy's crystals to the drinking water until it is a claret colour and a film of kerosene over the water will

prevent the spread of the germs. See that the birds have dry sleeping quarters with plenty of fresh air and avoid overcrowding (a most prevalent cause of chills).

Give each eye one drop of 5 per cent. argyrol daily until the "sweaty" eye disappears or bathe with boracic acid solution.

Leg Weakness.

Symptoms obvious—caused through either too much or too little animal matter in the feed, lack of bonemeal, or rheumatics caused through damp beds and runs.

See that the animal portion of the ration never exceeds 7½ per cent. Always have shell grit available and bonemeal in the ration.

Leg weakness may be caused through lack of sunlight. If ducklings are enclosed in a shed which has no means of allowing daylight to enter, leg weakness develops, due to lack of vitamins. It is never advisable to have a shed entirely enclosed. The front can always be open; this allows the health-giving rays to penetrate. Should the shed be enclosed add 2 per cent. cod liver oil to the mashes.

Do not confuse leg weakness with over heavy bodies which cannot be supported by the leg muscles because of the method of fattening.

Bronchitis and Pneumonia.

Should the colds and chills be far advanced one can try dosing the sick stock with one grain of quinine twice a day or one drop of aconite daily with Epsom salts in the water.

Scab on Leg and Bill.

This ailment is being noticed in Western Australia. It takes the form of a scab on the web of the feet, works up the leg and may also be noticed on the bill.

At present the disease is not classified, but a zinc ointment applied has proved satisfactory. Investigations are being carried out to isolate the cause of this disease.

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PASTURE COMPETITION.

DONNYBROOK DAIRY FARMERS' ASSOCIATION.

M. Cullity,
Senior Agricultural Adviser, Department of Agriculture.

The above association organised a competition in 1933, the results of which were published in the Journal of Agriculture for March, 1934. The final judging of this competition coincided with the first inspection of a three-year competition for which an annual statement of points will be given. Awards to the leading farmers in each year will be made on these results. The present report covers the inspections carried out in November, 1933, and in April and May, 1934, the April examination being made by Mr. C. Giles, Dairy Instructor. The same scale of points as for the previous competition was used, viz.:—

Permanency	30 points.
Feed Value	25 „
Cultivation and Manuring	10 „
Experimental Value	10 „
Bulk	25 „
Total	100 points.

Entries from the following farmers were received and their plots inspected:—

J. Egan, A. Trigwell, R. J. Trigwell, B. Langridge, J. Hearman, J. G. Fry, R. Benson, C. J. Cunningham, W. Johnston and A. C. Frost. Entries from H. Patroni and G. V. Mitchell were received too late for participation in this year's judging.

Times of inspection were arranged in order to view the plots in three stages of seasonal growth—(1) To assess summer, autumn, and spring growth; (2) to assess the numbers of species present, perennial and annual, the density and the vigour of growth; (3) to note the effect of cultural and manuring operations.

The points awarded are as follows:—

Name.	Permanency.	Feed Value.	Cultivation and Manuring.	Experimental Value.	Bulk.	Total.
Trigwell, A. (1) ...	24	24	8	6	22	84
Cunningham, C. J. ...	26	24	8	8	17	83
Egan, J.	24	22	7	4	25	82
Frost, A. C.	23	22	7	9	20	81
Benson, R.	28	21	6	4	20	79
Johnston, W.	26	24	7	7	15	79
Trigwell, A. (2) ...	24	23	7	6	17	77
Trigwell, R.	20	20	6	7	21	74
Langridge, B.	20	19	8	7	17	71
Hearman, J. (2) ...	20	21	7	7	14	69
Fry, J. G.	20	19	6	9	14	68
Hearman, J. (1) ...	18	18	8	6	9	59

The following comments on the plots are offered:—

A. Trigwell.—The two entries have only small differences but are grazed differently and, therefore, under the system of adjudication adopted, different values for bulk were given. These plots were very successful in the summer months and

showed very good growth after the early March rains. The perennial ryegrass, which has been established from seed collected on the property, is doing remarkably well, and with the subterranean clover forms an excellent pasture. The manurial treatment was one hundredweight of super. applied with the first rains in autumn (May) and a similar quantity of super. and ammonia in September. Pasture harrows were used in June and August, 1934, and were no doubt responsible for the greater growth noticeable at a still later inspection.

C. J. Cunningham.—This plot consisted of lucerne with the secondary plants subterreanean clover and couch grass. The site is an old river flat, fairly high and well drained. The ground was ploughed and cross ploughed in August, 1933. It was harrowed twice and then cultivated with the springtyne, after which a further harrowing was given. One bag of super. was harrowed in a month later, a day before seeding. Inoculation by culture was carried out and the seed was sown on the 24th of September, 1933, at the rate of 12½ lbs. per acre, being broadcast at half this quantity in one direction and then crossed with the remainder. The plot was cut during the end of November and again at the end of February, after which two good harrowings were given. In July four hundredweight of builders' lime were slaked and applied. A week later 1½ hundredweight of super. was topdressed over the area. The cutting in November yielded approximately 1¾ tons of hay per acre.

J. Egan.—This plot did not pick up after the summer as well as was expected. Of the grasses sown in addition to the original pasture only a few plants of *Phalaris tuberosa* could be seen. One hundredweight of nitrosuper was applied in April and one hundredweight of super, in August. No cultivation other than one stroke of the field harrows was given. The superiority of this plot in bulk in November, 1933, was largely responsible for it scoring so well.

A. C. Frost.—On the 10th April, 1933, 12 lbs. of Perennial ryegrass, 7 lbs. of cocksfoot, and 10 lbs. of *Phalaris tuberosa* were sown on a clay loam flat which was originally a cherry orchard. The ground had been fallowed during the preceding summer. One bag of potato manure "E" was applied at the time of sowing and a later dressing of one bag of super. was given on the 12th of September. A most promising result has been obtained with the ryegrass, but hardly sufficient of the Phalaris has persisted to repay the cost. Only odd plants of cocksfoot were noticeable.

R. Benson.—This entry consists of old pasture containing *Paspalum dilatatum,* ryegrass, *Lotus major*, *Lotus hispidus,* subterranean clover and spear grass. A very dense growth was inspected in November, 1933. After particularly heavy summer grazing the pasture was bare at the April inspection, but in May, after the rains, vigorous growth was again observed, a big proportion of which was ryegrass. One cwt. of nitrosuper was applied in April and the pasture was harrowed once only.

W. Johnston chose lucerne as his competition pasture. The site is a good flat originally carrying blackbutt and flooded gum. The ground was prepared in March, 1933, and was sown with oats. This crop was grazed and in September the remainder was ploughed in. On September 22nd the seed was sown. When inspected on the 14th of November good growth was evident. The cultivator was used twice in December following light rains. The growth was cut and left on the ground to form a covering mulch. On December 9 and again on the 28th the dairy herd was turned in to graze a 9 to 12-inch growth. Grazing with sheep was carried out in

February, although the summer growth was not as good as expected owing to the particularly severe climatic conditions. In June it provided more than a week's grazing for one hundred sheep.

R. J. Trigwell.—During the previous competition this entry gave considerable promise and over the summer and following the first rains good results were obtained. Lucerne flea had weakened the lucerne plants, and with the Perennial ryegrass indications of unhealthiness were also noted. The *Phalaris tuberosa* appeared to have improved a little over the preceding year. The results with ryegrass indicates the possibility of a reduced sowing proving helpful in some conditions in obtaining a good stand. Only 4 lbs. per acre were sown and almost a full cover was obtained, the individual plants being of large diameter.

B. Langridge.- The Perennial ryegrass on this plot gave good results in November, 1933, but during the dry season when inspection was made, little could be seen and the area gave the impression of being patchy. However, after the rains in May it could be seen that the rye was strengthening and a quick vigorous growth was obtained. Probably when the clover gets established more firmly over the whole of this paddock very much improved results will be obtained.

J. G. Fry.—The site chosen for this entry is on the top of one of the highest hills in the south-western part of Donnybrook. Five pounds of Perennial rye, one pound of cocksfoot, and one-half pound of *Phalaris tuberosa* were sown. Some of the seed was sown in strips and the remainder as a mixture. The results to date are particularly promising in regard to ryegrass and *Phalaris tuberosa*, and if these plants succeed in holding out in this location over two or three summers, very useful information will have been obtained. The lucerne and the cocksfoot have almost disappeared.

J. Hearman (two entries).- (1) Consisting of New Zealand red clover, white clover and *Lotus corniculatus*, with kikuyu roots planted throughout the accompanying subterranean clover. Growth has given a payable result on a small section only—that portion traversing a small billabong. The remainder is very sandy and dries out quickly. The sown clovers have given very little indication of being useful under these conditions, but subterranean clover and kikuyu grass are doing fairly well.

(2) Comprises ryegrass sown on a chocolate loam bank which is very steep. This was thickly covered with bracken three years ago but by cropping and mowing it is now practically clean. The ryegrass has given a particularly good result.

The following general comments may be of interest.

Of the species that have been sown on the plots, Perennial ryegrass has given the best results. Almost sufficient information has now been collected to warrant using it generally for the improvement of clover pastures. Probably the most important points to consider in attempting to establish this plant are (1) the fertility of the soil, (2) the strain of seed purchased.

Re strain, pasture investigations over the past few years have demonstrated very definitely that grass and clover seeds from certain areas have given superior results to those obtained from others, indicating that there are strains in pasture plants just as there are strains within one breed of cattle. During the recent years, seed certification schemes have been organised in New Zealand and Australia, and it is now possible to purchase seed of guaranteed parentage in an exactly similar manner to the purchase of a pedigree cow. The seed is certified to be from old persistent ryegrass pasture, and that it is guaranteed to be pure or, in other words, will produce similar plants to those existing in the original pasture. The persistency of

the resultant pasture will depend on the suitability of the many conditions which will vary from those where the seed was originally grown. However in this connection little information was forthcoming as to the source of the seed, the majority having been obtained at the local store, which may or may not have obtained a good strain. However results to date indicate that generally good strains were obtained. The results of Messrs. A. Ingwell and B. Langridge merit special mention inasmuch as their plots were sown with seed saved from old established pastures on their own properties. In future sowings, farmers are belatedly recommended to secure "home-saved" seed. Several may co-operate in buying a quantity so as to avoid the disadvantages of buying in small quantities.

Having a good strain of seed, the next most important point to consider is where it can be profitably sown. As indicated in our previous report, the fertility of the soil plays an important part in allowing plants to thrive. The better type pasture plants require soils of fairly high fertility and in deciding on the site for sowing, consideration must be given to this aspect. Where fertility is low, results can be obtained by manuring, but this may prove too expensive to be warranted.

In view of the foregoing it is common that to be effective manuring must run definitely at increasing the fertility of the soil. For most pastures superphosphate has been ample, but this promotes the growth of clovers and so to a degree worsens to depress the manure of grass. While chemical nitrogenous fertilisers are useful in raising the nitrogen content of soils, their application is limited owing to their relatively high cost. It is suggested that more use could be made of farmyard manure than is done at present. This supplies all the elements necessary and, in addition, a quantity of organic matter and many organisms which appear to be most effective in promoting growth. It is realised that the quantities of this manure that are available are extremely small, but every effort should be made to conserve as much as possible. Composts are strongly recommended to harness it and a portion of their plots with this manure and to note the result. Applications of super and nitrogenous manures should be discussed with on this account.

The palatability of a pasture depends largely on its composition, which will vary in composition as the seedling is growing fast. The palatability depends the amount that is eaten of a particular pasture and the relish with which it is eaten. It can be stated with confidence that a palatable pasture will produce more milk than an unpalatable one. Different species and strains exhibit varying degrees of palatability and the same applies to each plant just as the best lines, grazing record cattle. It has been ascertained that perennial ryegrass and white clover possess palatable merits as pure and growth qualities than any other species of the mixture. It may be mentioned here that while the object of management should undoubtedly be to provide a very palatable pasture, the fact that it is so may result in loss of persistency unless care is exercised in pasture management. This is a branch of management which should be worked out in each case to suit the local conditions.

Some concluding reference may be made to the information showing in some cases that the rate in seeding previously thought necessary for the establishment of certain plants appears to be too high in these conditions. Reference may be made to the seedings of perennial ryegrass on Messrs. V. J. Ingwell's, J. B. Fry's, A. J. Fry's, B. Langridge's and J. Egan's properties, which have given good results using 4 to 5 pounds of seed per acre. The lighter rate of seeding appears to allow more room for the individual plant to expand and provide greater root development. The net result is a full stand of good leading plants.

HERD TESTING, 1934-35.

THE OFFICIAL AUSTRALIAN PURE BRED DAIRY CATTLE PRODUCTION RECORDING SCHEME.

Conducted by Dairy Branch, Department of Agriculture, Western Australia.

Cows which completed test July 1 to November 30, 1934.

Name of Cow.	Breed	Herd Book No.	Date of Birth.	Date of Calving.	No. of Days in Test.	Weight of Milk Last day of Test.	Weight of Milk for period.	Average Test.	Butter Fat.	Owner.	Sire.
						lbs.	lbs.	%	lbs.		
MATURE COWS (OVER 5 YEARS OLD)—STANDARD 350 LBS. BUTTER FAT.											
Koojan Bonnie Jean	Guernsey	1612	22 3 26	22-9-33	273	27	9,216	5·96	549·63	A. W. Padbury ...	Robin of Nundorah
Koojan Wavelet	do. ...	1619	7-8-26	26-9-33	273	22	8,631	5·37	464·27	do. ...	do.
Brackenhurst Gibson's Melba ...	A.I.S. ...	13720	28 9 28	4-3-34	273	35·5	10,277	4·36	446·43	P. E. Warburton ...	Captain of Wongong
Denmark Rose Dame	Guernsey...	1794	19-8 27	14-2-34	273	28	8,694	5·00	437·34	Denmark Stud Farm	Rose Chief of Wollongbar
Venus 8th of Raleigh	A.I.S. ...	17540	3-2-28	26-9-33	273	25·5	11,996	3·60	431·58	Bevan & Sons ...	Royal Standard of Darbalara
Karridale Queen	Guernsey ..	2754	27 11 28	5-1-34	273	23·5	8,160	5·03	410·83	G. E. Scott ...	Minnamurra Oliver Twist
Wooroloo Beauty II.	A.I.S. ...	8602	20-5-28	10-12-33	273	15·3	8,552	4·50	384·75	Wooroloo Sanitorium	Commercial of Blackheath
Elsie 4th of Raleigh	do. ...	17481	24 1 27	27-12 33	273	29	9,957	3·85	383·41	D. Bevan & Sons ...	Union Jack of Raleigh
Denmark Rose Pearl 3rd ...	Guernsey...	1798	23-11-27	19 12-33	273	23	6,264	5·90	362·53	Denmark Stud Farm	Rose Chief of Wollongbar
Roslyn 2nd of Raleigh ...	do. ...	17533	19-10-27	3 2-34	273	22	8,451	4·00	336·71	D. Bevan & Sons ...	Union Jack of Raleigh
Kurrawong Royal Lady ...	do. ...	16049	6 4-25	21-9-33	273	25·5	9,916	3·36	333·94	W. G. Burges ...	Count Hughes of Cosy Camp
Claremont Belle 6th	do. ...	2386	29 9-28	13-12-33	210	17	8,295	...	323·94	C.H.I.	Clinker of Claremont
Mam'selle Mayflower of Stonehill	Jersey ...	30944	27-5-27	12-2-34	273	22	5,871	4·98	292·43	C. Kreins	Lassie's Chief of Roelands
Crantock Starbrights Rose ...	do. ...	28176	11 6-28	9-3-34	273	17	5,121	5·44	275·25	B. Burnside	Crantock Starbright s Chief
COWS OVER 4½ YEARS AND UNDER 5 YEARS OLD—STANDARD 330 LBS. BUTTER FAT.											
Burnside Judy	Guernsey...	2540	5-5-29	24-11 33	273	24	8,022	6·04	484·48	E. D. P. Hayes ...	Minnamurra Prairie Don
Wooroloo Betty	A.I.S. ...	7733	30-5-29	11-12-33	273	30	10,770	4·33	461·62	Wooroloo Sanatorium	Triumph of Pine Creek
Flash of Eastview	do. ...	18331	4 10 28	21-3-33	273	22	10,236	4·10	418·66	A. E. Grant	Mariner of Greyleigh
Snowdrop 25th of Kurrawong ...	do. ...	2693	6-3-29	2 3-34	273	35·5	9,302	3·9	363·47	P. E. Warburton ...	Premier 2nd of Kurrawong
Nooka Wild Rose	Jersey ...	28191	31-12 28	17-11-33	273	17·5	7,763	4·47	347·16	S. P. Herbert ...	Montrose East of Glen Iris
Karawarra Lofty 2nd	A.I.S. ...	15950	5 2-29	13-11-33	273	18	7,944	4·02	319·92	W. G. Burges ...	Sailor of Karawarra
COWS OVER 4 YEARS AND UNDER 4½ YEARS OLD—STANDARD 310 LBS. BUTTER FAT.											
Wyuna Lady Dawn ...	Guernsey...	2472	12 11-29	6 3-34	273	27	8,946	5·6	484·95	Denmark Stud Farm	Nundorah Prosper
Cookalabai Jewel	do. ...	3771	18-9 29	7-3-34	273	22	8,556	4·8	422·08	A. W. Padbury ...	Cookalabai Pride 2nd
Granthan Lady Fowler 5th ...	Jersey ...	28231	17-5 29	10-9-33	273	16·5	6,259	5·50	345·16	L. Temple	Grantham Starbright King
Minamurra Eleanor	Guernsey...	2607	13-8-29	14-10-33	273	22	7,416	4·54	337·07	Muresk College ...	Caramana Favour
Wollongbar Rosebud 2nd ...	do. ...	2789	10-1 30	9-3 34	273	11	6,858	4·82	332·51	Denmark Stud Farm	Wollongbar Satisfaction
Colmyn Ladybird	Jersey ...	31190	24-9-29	16-10-33	210	12·5	4,245	...	212·37	C. H. Ironmonger ...	Rye Duke of Glen Iris
Minathorpe Blanche 8th ...	A.I.S. ...	2474	20 10 29	7-11-33	273	8	4,929	4·12	203·28	R. Bee & Sons ...	Collier of Darbalara
Woodendale Duchess	Jersey ...	...	7-4-30	16-5 34	90	24·5	2,295	...	119·58	F. P. Atwell	Mokine Lady's Chief

COWS OVER 3½ YEARS AND UNDER 4 YEARS OLD—STANDARD 290 Lbs. BUTTER FAT.

Widgee Waa Rosy 5th ...	A.I.S. ...	5117	20-4-30	5-11-33	273	29	11,412	3·97	453·32	W. G. Burges ...	Parkview Mayflower's Monarch
Minnamurra Prairie Bell ...	Guernsey...	2619	2-11-29	19-10-33	273	26	7,083	4·93	349·77	Muresk College ...	Minnamurra Rex
Kudardup Bluebell	do. ...	2926	28-8-30	14-2-34	273	14	6,457	4·9	316·32	A. G. Haynes ...	Koojan Silver Robin
Nooka Twylish Madeira ...	Jersey ...	34744	16-7-30	30-1-34	273	16·5	6,769	4·43	299·84	S. P. Herbert ...	Springpark Prince Ragtime

COWS OVER 3 YEARS AND UNDER 3½ YEARS OLD—STANDARD 270 Lbs. BUTTER FAT.

Burnside Ladybird	Guernsey...	3322	8-10 30	27-11-33	273	25	7,845	4·96	390·70	E. D. P. Hayes ...	Denmark Radiant Chief
Glanavon Edna	A.I.S. ...	2361	10-7-30	5-10-33	273	21	8,358	4·18	349·46	Bevan & Sons ...	Raleigh Regent
Burnside Princess	Guernsey...	3324	1 8-30	3 12-33	273	25	7,335	4·8	346·16	E. D. P. Hayes ...	Denmark Radiant Chief
Poppy 3rd of Parkview ...	A.I.S. ...	4135	20-9-30	21-2-34	273	8	8,439	4·12	338·28	W. G. Burges ...	Mayflower's Repeater of Hillview
Blacklands Miss Jean 6th ...	do. ...	...	21-8-30	26-1-34	273	20	7,545	4·03	303·95	do.	Red Prince of Blacklands
Blacklands Lady Fanny 2nd ...	do. ...	...	25-8-30	20-1-34	273	21	7,503	3·9	292·64	do.	do. do.
Koojan Tiddlewinks	Guernsey...	3546	24-9-30	26-9-33	120	31	2,790	...	212·70	A. W. Padbury ...	Homestead Ace
Crantock Lady Buttercup ...	Jersey ...	39439	21-5-30	27-9-33	240	8	2,760	...	135·24	B. Burnside	Crantock Starbright's Montrose
Longridge Bess	A.I.S. ...	5104	15-8-30	26-10-33	180	10	3,420	...	153·66	R. Bee & Son ...	Minathorpe Kitchener

COWS OVER 2½ YEARS AND UNDER 3 YEARS OLD—STANDARD 250 Lbs. BUTTER FAT.

Claremont Maggie Morrison 9th	A.I.S. ...	8329	12 11-30	14-9-33	273	30	9,660	3·95	382·12	C.H.I.	Claremont Elector
Nooka Daisy	Jersey ...	41282	27 3-31	3-12-33	273	26	7,368	4·7	344·52	S. P. Herbert ...	Springpark Prince Ragtime
Fussy 37th of Hillview ...	A.I.S. ...	8412	13-4-31	28-1-34	273	31·5	8,885	3·4	303·70	P. E. Warburton ...	Limelight of Hillview
Parkview Favourite 2nd ...	do. ...	4127	6-4-31	31-10-33	273	20	7,350	4·06	298·78	W. G. Burges ...	Daphne's Defiance of Hillview
Stone Hill May	Jersey ...	34762	4 11-30	12-10-33	273	13	4,104	6·47	265·53	C. Kreins	Roeland's Favourite Butter King
Daphne 6th of Hillview ...	A.I.S. ...	...	17 6-31	13-2-34	273	21	5,958	4·26	253·11	Bevan & Sons ...	Mayflower's Emblem of Hillview
Bonnie Maid of Greenmount ...	Jersey ...	34835	15-5-31	13-2-34	273	12	4,386	5·4	238·00	A. J. B. Stremple ...	Grantham Starbright's King

COWS UNDER 2½ YEARS OLD—STANDARD 230 Lbs. BUTTER FAT.

Nooka May Queen	Jersey ...	41283	3-5-31	24-9-33	365	18·5	9,969	5·2	522·00	S. P. Herbert ...	Springpark Prince Ragtime
Claremont Dover 7th ...	A.I.S. ...	8327	24-5-31	18-10-33	273	20	7,770	4·44	345·55	C.H.I.	Searchlight of Sunnyvale
Claremont Primrose 2nd ...	do. ...	...	27-6-31	2-12-33	273	27	8,631	4·0	345·07	do.	do. do.
Denmark Prosper's Lass ...	Guernsey...	3274	22-12-31	3-3-34	273	20	6,360	5·02	319·53	A. G. Haynes ...	Koojan Golden Prosper
Muresk Zinnia	do. ...	3294	14-10-31	2-11-33	273	21	7,128	4·4	313·71	Muresk College ...	Milton Victory 2nd
Rodyr Park's Dorothy	Jersey ...	...	27-7-31	31-8-33	273	14·5	6,133	4·9	304·35	L. Temple	Melrose Clarion
Glanavon Esmeralda	A.I.S. ...	6728	24-9-31	9-11-33	273	24	6,597	4·61	304·13	Bevan & Sons ...	Villiers of Darbalara
Glanavon Sunbeam 2nd ...	do. ...	...	28-9-31	6-10-33	273	23·5	6,730	4·32	291·15	do.	do. do.
Claremont Treasure 6th ...	do. ...	...	11-10-31	28-11-33	273	20	6,840	4·09	280·10	C.H.I.	Searchlight of Sunnyvale
Stonehill Lady	Jersey ...	42015	8-10 31	24 11-33	273	13	4,689	5·7	267·84	C. Kreins	Roeland's Favourite Butter King
Colmyn Buttercup	do. ...	39319	10-10-31	25-10-33	273	14·5	4,738	5·48	260·21	C. H. Ironmonger ...	Rye Duke of Glen Iris
Denmark Annabel	Guernsey...	3264	17-6-31	23-11-33	273	10	4,830	5·3	256·28	Denmark Stud Farm	Wollongbar Reformer
Wooroloo Jean 2nd	A.I.S. ...	7739	25-8-31	18-10-33	273	15·5	5,941	4·12	245·19	Wooroloo Sanatorium	Triumph of Pine Creek
Charming Queen of Greenmount	Jersey ...	40099	9-6-32	19 2-34	273	15	4,635	5·25	243·53	A. J. B. Strempel ...	Grantham Easter King
Wooroloo Margaret 2nd ...	A.I.S. ...	7743	28-11-31	3-12-33	273	16	4,968	4·11	205·21	Wooroloo Sanatorium	Triumph of Pine Creek
Wooroloo Milkmaid 3rd ...	do. ...	...	16-10-31	27-12-33	273	14	4,977	4·13	204·70	do. do.	do. do.
Longridge Gem 2nd	do. ...	...	2-9-31	7-12-33	273	15	4,595	4·09	187·99	R. Bee & Son ...	Minathorpe Kitchener
Longridge Melba	do. ...	...	16-11-31	14-12-33	273	11·5	4,310	4·19	180·89	do.	do. do.
Blackland's Primrose 7th ...	do. ...	...	2-7-31	1-1-34	210	12	3,750	...	164·79	W. G. Burges ...	Orama of Blacklands
Wooroloo Eva	do. ...	7738	29-3-32	5-7-34	60	18	1,195	...	49·71	Wooroloo Sanatorium	Wooroloo Duke 3rd

A.I.S. = Australian Illawarra Shorthorn.

HERD TESTING—*continued.*

PROGRESS REPORT FOR QUARTER ENDED 28th FEBRUARY, 1935.

Name of Cow.	Breed.	Herd Book No.	Date of Birth.	Date of Calving.	No. of Days in Test.	Weight of Milk Last day of Test.	Weight of Milk for period.	Average Test.	Butter Fat.	Owner.	Sire.
						lbs.	lbs.	%	lbs.		
MATURE COWS (5 YEARS AND OVER)—STANDARD 350 LBS. BUTTER FAT.											
Telyarup Duchess	A.I.S.	2504	9-12-28	10-5-34	273	31·5	15,094	3·73	564·37	A. E. Grant	Baron of Darbalara (2824)
Wooroloo Rose 2nd	do.	2523	27 4 29	22-5-34	273	26	12,033	4·50	542·58	Wooroloo Sanatorium	Triumph of Pine Creek (2515)
Flash of East View	do.	18331	4-10-28	16 4-34	273	25·5	12,871	4·12	531·04	A. E. Grant	Mariner of Greyleigh (587)
Minathorpe Treasure III.	do.	Vol. 8	10-7-28	3-5-34	273	32	10,086	4·62	466·63	P. E. Warburton	Minathorpe Bruce
Minnamurra Orvieto	Guernsey	1597	4 8-26	17-4-34	273	22	8,601	4·86	420·65	A. G. Haynes	Minnamurra Golden Lad (402)
Grass Vale Montrose Maid	Jersey	24929	18 6 27	1 5-34	273	20	7,995	5·24	416·27	R. H Rose	Montrose East of Glen Iris
Kurrawong Pet V.	A.I.S.	16042	2-8-26	20-5-34	273	13	11,175	3·69	412·22	A. E. Grant	Premier of Kurrawong (1212)
Claremont Stella III.	Do.	17929	31 12 25	15-3-34	273	27	10,851	3·90	409·65	Claremont Hospital for Insane	Searchlight of Sunnyvale
Summerlea Hobby II.	do.	2437	13-3-28	4-5 34	273	28	11,364	3·44	391·51	Dunkley Bros.	Musket of Claremont
Kurrawong Snowdrop XXII.	do.	18229	14-10-28	27-4-34	273	21	9,918	3·90	386·74	A. E. Grant	Merry Count of Berry (2692)
Kurrawong Nancy III.	do.	...	9-3-29	20 5-34	273	19	9,432	3·89	367·09	Bevan & Sons	Premier II. of Kurrawong (2693)
Blacklands Vision	do.	12082	2-5-26	25 4-34	273	18	9,054	4·00	362·94	W. G. Burges	Fussy's Monarch of Hill View (493)
Karrawarra Champion II.	do.	1253	6-5-28	21 4-34	273	21	9,318	3·87	361·27	Bevan & Sons	Sailor of Karawarra
Springmead Fern	Jersey	27213	5-3-28	6-5-34	273	18·5	7,255	4·93	357·64	Sabina Vale	Springmead Islander (4359)
Moorlands April	do.	23687	3-9-26	15-3-34	273	16	6,543	5·36	351·10	P. Rose	Colonel of Melrose (4015)
Telyarup Della II.	A.I.S.	2503	11-11-28	3-5-34	240	13	8,745	...	344·01	A. E. Grant	Baron of Darbalara (2824)
Wooroloo Alice II	do.	2517	19 4 28	6-5-34	273	16·5	7,414	4·34	322·12	Wooroloo Sanatorium	Triumph of Pine Creek (2515)
Summerlea Red Rose I.	do.	Vol. 8	1-8-26	17-2-34	273	23	9,249	3·42	316·29	Dunkley Bros.	Musket of Claremont
Nooka Lass	Jersey	28187	14-1-29	14-3-34	273	18·5	6,655	4·50	300·64	S. P. Herbert	Jessie's King of Sarnia (4578)
Summerlea Hobby I.	A.I.S.	Vol. 8	10 7-21	24-5 34	273	18	8,424	3·45	290·81	Dunkley Bros.	Lord of Summerlea
Summerlea Betty I.	do.	Vol. 8	23 8-25	7 5-34	273	14	7,632	3·49	266·68	do.	Musket of Claremont
Telyarup Milkmaid II.	do.	2505	15-10-28	23-3 34	273	6·5	7,384	3·48	258·15	A. E. Grant	Baron of Darbalara (2824)
Tipperary Pansy	do.	2442	2 12 28	25-3-33	180	...	6,135	...	255·81	E. T. Thatcher	Villiers of Darbalara (2386)
Summerlea Melba I.	do	5134	29 1 29	1-5-34	273	7	6,846	3·44	236·10	Dunkley Bros.	Victor of Telyarup (2498)
Koojan Daffodil	Guernsey	2231	4-10 28	11 4 34	240	9	4,335	5·40	234·15	E. D. P. Hayes	Koojan Golden Govenor (595)
Juadine Sparkle II.	Jersey	...	4-6-28	2-8 34	150	26	5,340	...	233·45	Miss L. G. Hancock	Mokine Hero
Koojan Bonnie Buttercup	Guernsey	2230	18-10-28	17-4-34	240	7	4,275	5·40	232·14	E. D. P. Hayes	Koojan Golden Governor (595)
Moorlands Clara	Jersey	28215	18 8 28	6 7-34	120	26·5	4,200	...	199·77	P. Rose	Grafter of Melrose
Moorlands Coral	do.	28222	15-8 28	6-7-34	150	12	3,705	...	193·80	P. Rose	do.
Eva of Mark's Villa	A.I.S.	16479	15-4-26	27-5-34	150	24·5	4,395	...	182·55	P. E. Warburton	Searchlight of Sunnyvale
Minathorpe Carnation IV.	do.	2475	2-8-28	12-8-34	120	23	4,230	...	173·46	R. Bee & Son	Collier of Darbalara (1997)
Minathorpe Blanche VI.	do.	17937	13-6-28	20-5-34	90	24	2,400	...	106·86	do.	do. do. do.

SENIOR 4-YEAR OLDS (OVER 4½ AND UNDER 5 YEARS) STANDARD 330 LBS. BUTTER FAT.

Minnamurra Palm Olive ...	Guernsey...	2616	30-8-29	24-4-34	273	27	9,141	4·16	480·21	Muresk Agricultural College	Caramana Favour
Wyuna Jean	Guernsey...	2471	8-9-29	22-5-34	273	...	8,410	5·07	426·25	W. G. Burges ...	Nundorah Buccaneer (612)
New Park Amy VII.	A.I.S. ...	1865	14-6-29	2-4-34	273	16	10,653	3·70	397·88	Muresk Agricultural College	Ruler of Greyleigh (1855)
Claremont Star II.	A.I.S. ...	...	1-8-29	14-3-34	273	17	8,181	4·27	333·66	C.H.I.	Claremont Elector (446)
Moorlands Doris	Jersey ...	31235	14-5-29	17-3-34	273	11	5,823	5·02	292·81	P. Rose	Moorlands Romeo
Summerlea Milkmaid IV. ...	A.I.S. ...	5136	13-10-29	23-5-34	273	12	6,576	4·28	281·80	Dunkley Bros. ...	Victor of Telyarup (2498)
Tipperary Priscilla	do. ...	2359	9-9-29	17-4-34	240	10·5	6,390	4·25	271·68	R. Bee & Sons ...	Villiers of Darbalara (2386)

JUNIOR 4-YEAR OLDS (OVER 4 AND UNDER 4½ YEARS)—STANDARD 310 LBS. BUTTER FAT.

Minnamurra Currency Lass ...	Guernsey...	2606	27-10-29	10-4-34	273	19·5	7,468	4·96	371·16	Muresk College ...	Caramana Favour
Summerlea Tulip III.	A.I.S. ...	5140	2-8-29	1-4-34	273	23	7,989	3·35	267·63	Dunkley Bros. ...	Victor of Telyarup (2498)
Summerlea Victoria II. ...	do. ...	5141	21-8-29	20-3-34	273	23	7,569	2·97	225·10	do.	Musket of Claremont
Summerlea Countess II. ...	do. ...	5129	1-8-29	28-3-34	240	11	6,630	3·14	208·80	do.	Victor of Telyarup (2498)

SENIOR 3-YEAR OLDS (OVER 3½ AND UNDER 4 YEARS)—STANDARD 290 LBS. BUTTER FAT.

Travalgan Lady Mint	Jersey ...	34789	21-6-30	11-4-34	273	24	8,712	5·53	482·45	Robinson Bros. ...	Fern's Masterpiece of Garden Hill
Staghorn Northern Belle ...	do. ...	34786	10-9-30	11-4-34	273	24	7,647	5·84	447·19	do.	Staghorn Northlark's Masterpiece
Wooroloo Red Rose III. ...	A.I.S. ...	5226	27-9-30	3-5-34	273	16	7,743	4·69	363·62	Wooroloo Sanatorium	Triumph of Pine Creek (2515)
Grass Vale Lady Fowler 11th ...	Jersey ...	34817	26-5-30	2-5-34	273	14·5	5,833	5·93	346·35	R. H. Rose	Choice Goods of Garden Hill (4580)
Grantham Air Lady	do. ...	34824	18-7-30	26-4-34	273	12	6,501	5·26	341·99	J. A. Sears	Banyule Altitude (5793)
Greenmount Starbright Marinora	do. ...	34841	31-5-30	21-3-34	273	16·5	6,184	5·50	340·57	A. J. B. Strempel ...	Werribee Starbright's Butter King
Wooroloo Bloomer	A.I.S. ...	5218	5-10-30	28-3-34	273	21·5	7,924	4·25	337·50	Wooroloo Sanatorium	Triumph of Pine Creek (2515)
Moorlands Elsie	Jersey ...	34803	12-6-30	18-5-34	210	7	4,695	242·05	242·05	P. Rose	Melrose Romeo (5861)

JUNIOR 3-YEAR OLDS (OVER 3 AND UNDER 3½ YEARS)—STANDARD 270 LBS. BUTTER FAT.

Swanlea Lovely VII.	A.I.S. ...	...	12-2-31	5-6-34	273	17	9,241	3·58	330·87	A. E. Grant	Headlight of Parkview
Karridale Girlie	Guernsey...	3820	24-9-30	15-3-34	273	18	6,144	5·38	330·70	G. E. Scott	Minnamurra Rose Chief (1016)
Travalgan Ice Cream	Jersey ...	...	6-2-31	22-5-34	240	11	5,160	...	296·33	Robinson Bros. ...	Banyule Altitude (5793)
Wooroloo Margaret	A.I.S. ...	5223	7-10-30	7-4-34	273	15	6,780	4·26	289·04	Wooroloo Sanatorium	Triumph of Pine Creek (2515)

SENIOR 2-YEAR OLD (OVER 2½ YEARS AND UNDER 3 YEARS)—STANDARD 250 LBS. BUTTER FAT.

Glanavon Greta	A.I.S. ...	...	14-7-31	8-5-34	273	20·5	7,951	4·30	342·57	Bevan & Sons ...	Villiers of Darbalara (2386)
Greenmount Gentle Lass ...	Jersey ...	34838	9-8-31	29-5-34	273	10	5,813	5·43	316·18	A. J. B. Strempel ...	Grantham Starbright's King (5796)
Greenmount Little Gem ...	do. ...	34839	9-6-31	10-5-34	273	13·5	6,010	5·22	312·68	do. ...	Grantham Easter King (6510)
Greenmount Marinette	do. ...	34840	24-5-31	26-4-34	273	11·5	5,659	4·62	261·75	do. ...	Grantham Starbright's King (5796)
Milbank Joan IV.	A.I.S. ...	4976	7-5-31	24-3-34	273	16	5,898	3·83	225·45	Dunkley Bros. ...	Parkview Ruler
Claremont Maggie IV.	do. ...	...	5-9-31	4-5-34	210	13	4,275	...	184·17	Claremont Hospital for Insane	Searchlight of Sunnyvale (2302)
Woodendale Butterfly	Jersey ...	...	30-8-31	28-5-34	210	10·5	3,165	...	178·61	F. P. Atwell	Werribee's Starbright's King

A.I.S. = Australian Illawarra Shorthorn.

HERD TESTING—*continued*

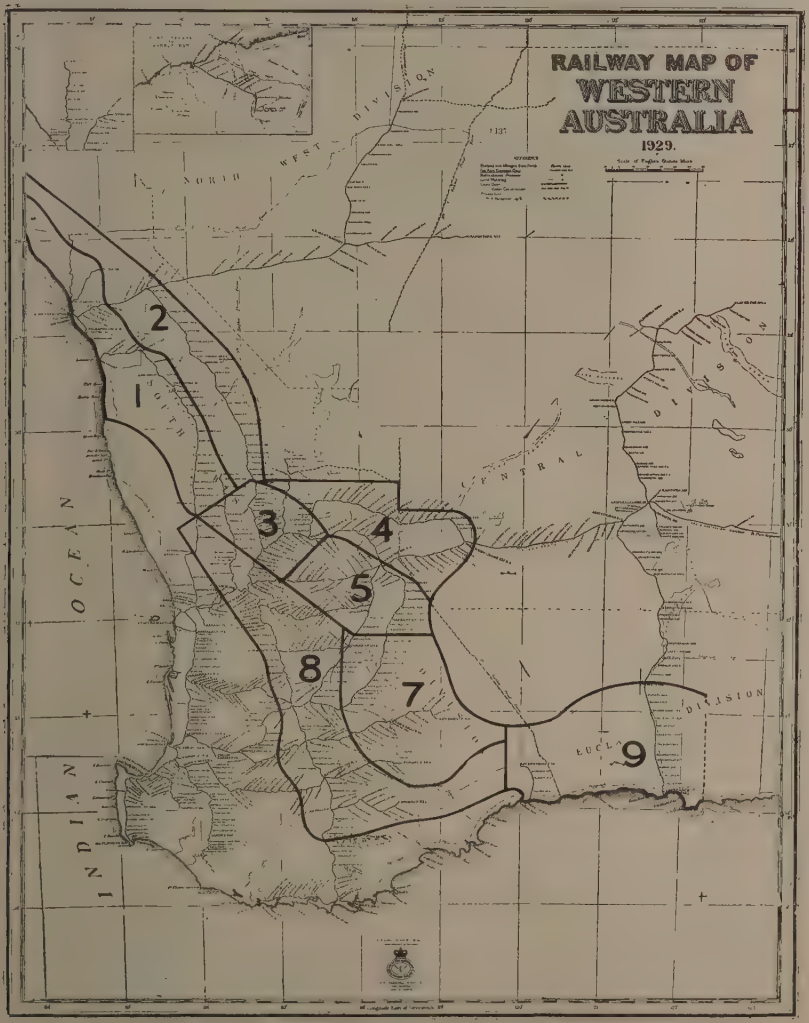
Name of Cow.	Breed.	Herd Book No.	Date of Birth.	Date of Calving.	No. of Days in Test.	Weight of Milk Last day of Test.	Weight of Milk for period.	Average Test.	Butter Fat.	Owner.	Sire.
						lbs.	lbs.	%	lbs.		
JUNIOR 2-YEAR OLD (UNDER 2½ YEARS)—STANDARD 230 LBS. BUTTER FAT.											
Blacklands Beauty 10th ...	A.I.S. ...	...	2-4-32	8-4-34	273	27	9,336	3·90	363·75	W. G. Burges ...	Fussy's Monarch of Hill View (493)
Denmark Rosebud	Guernsey	...	14-3-32	15-5-34	273	17	6,471	5·57	360·63	Denmark Stud Farm	Wollongbar Macquarrie
Claremont Maggie Morrison 12th	A.I.S. ...	...	25-10-31	14 4-34	273	26	8,718	4·12	359·91	Claremont Hospital for Insane	Claremont Elector (446)
Denmark Prosper's Lady ...	Guernsey	3273	6-12-31	27-4-34	273	19	5,907	5·85	346·08	Denmark Stud Farm	Koojan Golden Prosper (2283)
Claremont Biddy 19th	A.I.S. ...	...	19-10-31	12-4-34	273	26	8,703	3·97	345·55	Claremont Hospital for Insane	Claremont Elector (446)
Koojan Ace's Waterwave ...	Guernsey	...	23-8-32	1-4 34	273	19·5	6,208	5·49	340·94	A. W. Padbury ...	Homestead Ace
Colmyn Snowflake	Jersey ...	39327	10-11-31	29-3-34	273	19·5	6,508	5·16	336·16	C. H. Ironmonger ...	Rye Duke of Glen Iris (1994)
Fairfield Royal Lu Lu ...	A.I.S. ...	...	22-3-32	29 3-34	273	23	7,899	3·90	310·32	W. G. Burges ...	Kinsman of Greyleigh III.
Denmark Golden Marie ...	Guernsey	...	26-4-32	7-6 34	273	15	5,232	5·85	306·51	Denmark Stud Farm	Koojan Golden Prosper (2283)
Wooroloo Betty III.	A.I.S. ...	7735	17-12-31	20 2-34	273	20	6,495	4·50	292·34	Wooroloo Sanatorium	Triumph of Pine Creek (2515)
Wooroloo Pearl	do. ...	7746	12-12-31	1 3-34	273	19	6,147	4·60	276·61	do. ...	Tipperary Persimmon (471)
Denmark Prosper's Dinah ...	Guernsey	3272	7-12-31	3-5-34	273	11	4,743	5·75	272·97	Denmark Stud Farm	Koojan Golden Prosper (2283)
Denmark Prosper's Velvet ...	do. ...	3875	23-3-32	12-4-34	273	13	4,959	5·25	260·54	do. ...	do.
Muresk Princess	do. ...	3879	3-5 32	6-5-34	273	16	5,748	4·48	260·41	Muresk College ...	Nundorah Climax
Colmyn Linda	Jersey ...	39323	19-3-32	1-5-34	273	14·5	4,468	5·48	245·18	C. H. Ironmonger ...	Colmyn Capt. Mack (5855)
Tabbagong Dove 8th	A.I.S. ...	7511	19-12-31	21-4-34	273	16	5,748	4·15	238·80	W. G. Burges ...	Parkview Reward II. (260)
Hillcrest Shamrock V.	do. ...	3043	9-1-32	20-5-34	273	21·5	7,160	3·28	235·11	P. E. Warburton ...	Hillcrest Don
Coogley Radiant Queen ...	Guernsey	...	7-10-32	1-6-34	273	11	4,419	5·15	227·87	E. D. P. Hayes ...	Denmark Radiant Chief
Brackenhurst Treasure	A.I.S. ...	5214	18-5-32	25-3-34	273	18	5,049	4·32	218·43	P. E. Warburton ...	Tipperary Royal's Re-Echo
Moorlands Glory	Jersey ...	...	23-4-32	19-3-34	273	7	4,191	5·05	211·95	P. Rose	Melrose Sultan (6930)
Blacklands Myrtle VIII. ...	A.I.S. ...	...	3-9-32	2-6-34	240	12	5,275	...	202·02	A. E. Grant	Parkview Limelight (370)
Claremont Belle 10th	do. ...	...	12-1-32	5-5-34	273	14·5	4,425	...	185·28	Claremont Hospital for Insane	Searchlight of Sunnyvale (2302)
Greenmount Butterfly	Jersey ...	40098	21-4-32	22-4-34	210	16·5	3,675	...	179·55	A. J. B. Strempel ...	Grantham Easter King (6510)
Moorlands Gleam	do ...	...	2-5-32	19-5-34	180	10·5	2,595	...	147·81	P. Rose	Melrose Sultan (6930)

A.I.S. = Australian Illawarra Shorthorn.

ROYAL AND DISTRICT AGRICULTURAL SOCIETIES' 50-ACRE CROP COMPETITIONS, 1934.

I. Thomas, Superintendent of Wheat Farms.

Entry for these competitions is made through the local Agricultural Societies. These societies organise their own district competitions, the first and second prize winners of which automatically become eligible to compete for the Royal Agricultural Society zone prize. Where the local society does not conduct a com-



Map showing boundaries of the respective zones.

petition, entry is accepted direct with the parent body, the Royal Agricultural Society. In this way no farmer, desirous of doing so, is prevented from participating.

As can be readily understood, there is considerable variation in rainfall, soil, etc., in a wheat belt so widely extended. For these reasons it has been subdivided into eight zones in such a manner that districts having similar interests and climatic conditions have been grouped together. In this way farmers may compete with each other more equitably. The accompanying map shows the eight zones referred to.

In each of these zones a championship prize of £10 and a second prize of £2 10s. are awarded.

In addition to these zone prizes the Royal Agricultural Society each year offers a special prize of £5 5s. to the competitor in any zone obtaining the highest calculated bushel yield per acre.

The conditions of the competitions require that the crop shall be grown on fallowed land, shall not be less than 50 acres in area of one variety, and shall be judged under the following scale of points:—

Yield	50 points.
Freedom from weeds	10 ,,
Freedom from disease	10 ,,
Freedom from admixture	15 ,,
Evenness of growth	15 ,,
Total	100 points.

The system adopted has been to allot one point for each calculated bushel yield, which is determined not by estimation but upon that calculated from portions of the crop obtained from small areas taken systematically throughout the crop. These samples are then threshed and the grain weighed.

Since the inception of the Royal and District Crop Competitions the judges have been Departmental Officers attached to the Wheat Branch of the Department of Agriculture.

The detailed awards made are as follow:—

ZONE I.

Judge: G. L. Throssell, Agricultural Adviser.

Competitors: Carnamah Society, 7; Three Springs Society, 1; Total, 8.

The rainfalls recorded in the various competing districts in this Zone are as follow:—

					Growing Period.								Total for
Place.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Year.
Carnamah ...	46	21	539	409	41	270½	226	263	82	12	894	22	15	1,946
Three Springs	114	15	497	407	34	235	258	259	62	19	867	29	12	1,941

None of the crops inspected was entirely free from rust, but in most cases the infection was very slight. Higher yields would undoubtedly have been obtained had good finishing rains fallen. With few exceptions so far as the competition crops were concerned, the shortage of spring rains was of greater consequence than was the incidence of rust.

CARNAMAH AGRICULTURAL SOCIETY.

The following tables show the awards made and the cultural details of the respective competitors:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Bothe, B. D. ...	Coorow ...	Bencubbin ...	37	8	8	14	13	80
Rudduck, A.	do. ...	Bencubbin ...	34	9	8	14	13	78
Forrester, J. K. ...	Carnamah ...	Gluyas Early	30	8	8	14	13	73
Clark, R. W.	do. ...	Nabawa ...	25	8	8	13	12	66
Tucker, A. P. ...	do. ...	Bencubbin ...	25	8	8	13	12	66
Green, J. W.	do. ...	Merredin ...	23	8	8	13	12	64
Sharpe, Mrs. A. S. ...	do. ...	Felix ...	16	8	6	12	14	56

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original timber.	When Ploughed.	Implements.	Depth.	Condition of land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					ins.				lbs.	lbs.			
Bothe, B. D. ...	14	Salmon gum	June-July	Mouldboard and Disc	3-4	Good	Cultivated with combined cultivator drill in August, September, and March; planted with same implement	Mid-May ...	50	112	Copper carbonate	Yes ...	Traces of rust and take-all.
Rudduck, A. ...	5	Morrel and gimlet and salmon gum	Mid-June...	Mouldboard	4	Good	Disc cultivated in September. Scarified in April, prior to planting with disc drill	3rd week April	50	168	Copper carbonate	Yes ...	Traces of septoria and rust.
Forrester, J. K.	7	Yorkgum and black wattle	July ...	Cultivating disc	3 4	Good	Disc cultivated in August, scarified in October, and springtyne cultivated after March rains. Planted with Sunderseeder	3rd week May	45	110	Copper carbonate	Yes ...	Traces of rust and take-all.
Clark, R. W. ..	5	Gimlet and black wattle	July-August	Mouldboard	4½	Wet	Springtyne cultivated in September and April. Planted with combined cultivator drill	1st week May	45	100	Copper carbonate	Yes ...	Traces of rust and take-all.
Tucker, A. P.	20	Salmon gum and yorkgum	Mid-July ...	Cultivating disc	3-4	Good	Disc cultivated at end of August and prior to seeding. Planted with combined cultivator drill	3rd week May	48	90	Copper carbonate	Yes ...	Traces of rust and take-all.
Green, J. W. ...	4	Yorkgum and jam	July ...	Cultivating disc	3 4	Wet	Disc cultivated early in September. Planted with Sunderseeder	3rd week May	50	90	Copper carbonate	Yes ...	Rust and flag-smut.
Sharpe, Mrs. A. M.	6	Yorkgum and jam	June ...	Cultivating disc	4	Good	Disc cultivated prior to seeding. Planted with combined cultivator drill	4th week May	48	93	Copper carbonate	Yes ...	Rust.

THREE SPRINGS AGRICULTURAL SOCIETY.

The following tables show the awards and cultural details of the single competitor:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Williamson, A. M.	Three Springs	Merredin ...	33	9	8	13	14	77

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original timber.	When Ploughed.	Implements.	Depth.	Condition of land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
									lbs.	lbs.			
Williamson, A. M.	12	Salmon gum	Late June	Scarifier ...	4	Good	Scarified late in August and early in September again before planting with combined cultivator drill	2nd and 3rd week May	55	90	Copper carbonate	Yes ...	Traces of rust.

ZONE 2.

Judge: G. L. Throssell, Agricultural Adviser.

Royal Society, 5 competitors.

ROYAL AGRICULTURAL SOCIETY.

The rainfall recorded in the various competing districts in this Zone is as shown hereunder:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total. for Year.
Damboring ...	61	3	120	470	61	174	214	110	78	8	645	70	13	1,382
Perenjori ...	44	7	336	361	30	202	198	213	60	*Nil*	703	17	*Nil*	1,468
Mullewa ...	138	17	483	378	47	282	260	192	56	14	851	7	12	1,886

None of the crops inspected was entirely free from rust, but in most cases the infection was very slight. Higher yields would undoubtedly have been obtained had good finishing rains fallen. With few exceptions, so far as the competition crops were concerned, the shortage of spring rains was of greater consequence than was the incidence of rust.

The following tables show the awards made and the cultural details of the various competitors:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Moore, Hon. T. ...	Indarra ...	Merredin ...	32	9	8	14	14	77
Sutcliffe, J. & G. ...	East Damboring	Bencubbin ...	31	9	8	13	14	75
Baxter, E.	Perenjori ...	Merredin ...	27	9	9	13	14	72
Rumble, M. & E. J....	Mullewa ...	Gluclub ...	31	8	7	12	13	71
O'Brien, J. J. ...	do. ...	Bencubbin ...	26	8	7	13	13	67

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original timber.	When Ploughed.	Implements.	Depth.	Condition of land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs.			
1. Moore, Hon. T.	6	Yorkgum and jam	End of June	Disc ...	3	Very wet	Springtyne cultivated in August, September, and March. Planted with combined cultivator drill	2nd and 3rd weeks in May	60	100	Copper carbonate	Re-cleaned	Rust.
2. Sutcliffe, J. & G.	12	Salmon and gimlet	June-July	Cultivating disc	3½	Getting hard	Scarified at end of July and August, springtyned in September, and scarified early in May	3rd week in May	38	90	Copper carbonate	Yes ..	Traces of rust.
3. Rumble, M. & E. J.	4	Jam and kurrara	End of June	Cultivating disc	3½	Good	Portion springtyne cultivated at end of August. All cultivated before seeding with disc drill	Mid-May ..	60	70	Copper carbonate	Yes ...	Rust.
4. Baxter, E. & J. B.	6	Yorkgum ...	July ...	Disc ...	3–4	Good	Springtyne cultivated at end of August and September, harrowed after March rain, and springtyne cultivated early in April and end of April. Planted with combined cultivator drill	Mid-May ..	48	110	Copper carbonate	Yes ..	Trace of flagsmut.
5. O'Brien, J. J.	6	Salmon, yorkgum and jam	July ...	Disc ...	4	Good	Springtyne cultivated before seeding	June	60	60	Copper carbonate	Yes ..	Rust.

ZONE 3.

Judge: R. P. Roberts, Agricultural Adviser.

Royal Society, 1 competitor.
Wyalkatchem Society, 4 competitors.
Total, 5 competitors.

The rainfall recorded at the respective competing centres in the Zone is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period: May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Wyalkatchem...	124	40	77	569	85	228	195	134	49	6	697	33	11	1,551
Cowcowing ...	129	33	125	403	56	133	189	137	44	12	571	75	4	1,340
Korrelocking ...	87	12	94	600	86	258	185	128	80	4	741	53	8	1,595
Wongan Hills...	67	17	220	279	104	234	321	204	78	24	965	51	10	1,609

In view of the dry conditions experienced during the Spring months the excellent yields obtained reflect considerable credit on the farming methods of the competitors.

WYALKATCHEM AGRICULTURAL SOCIETY.

The awards made and the cultural details of the several competitors are given in the accompanying tables:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Jones, W. W. ...	Cowcowing ...	Bencubbin ...	31	9	9	13	14	76
Threlfall, H.	Korrelocking ...	Bencubbin ...	27	9	8	14	13	71
Lehman & Richardson	Cowcowing ...	Gluclub ...	29	8	8	12	12	69
Brown, T. E.	Wyalkatchem...	Bencubbin ...	25	7	8	13	13	66

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					ins.				lbs.	lbs.			
Jones, W. W.	Old land	Salmon gum and scattered gimlet	June ...	Rigid-tyne scarifier	3	Good	Cultivated with scarifier in August	1st week in May	50	90	Copper carbonate	Yes ...	Traces of rust and flagsmut.
Threlfall, H. ...	Old land	Gimlet ...	Early June	Mouldboard	4	Good	Cultivated with a scarifier in September and again late in April	Early May ...	50	112	Copper carbonate	Yes ...	Root rot and traces of flagsmut and flying smut.
Lehman and Richardson.	7	Morrel, yorkgum and mallee	April ...	Disc ...	3½	Good	Springtyne cultivated in July	Mid-May ...	42	78	Copper carbonate	Yes ...	Flagsmut.
Brown, T. E. ...	Old land	Salmon gum	End of June	Disc cultivating plough	3	Good	Springtyne cultivated in September and October, and again after rain in March and April	Mid-May ...	56	112	Copper carbonate	Yes ...	Root rot and traces of flagsmut.

ROYAL AGRICULTURAL SOCIETY.

The awards and cultural details of the single entry in this Zone are as follow:

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Mt. Rupert Estate	Wongan Hills	Gluclub ...	29	7	8	12	13	69

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
Mt. Rupert Estate	Old land	Salmon gum, gimlet and morrel	August ...	Mouldboard	in. 3	Good	Harrowed in September and springtyne cultivated	Last week in May	lbs. 40	lbs. 112	Copper carbonate	Yes ...	Flagsmut and a little ball smut.

ZONE 4.

Judge: I. Thomas, Superintendent of Wheat Farms.

Kulja Society, 4 competitors.
Mt. Marshall Society, 3 competitors.
Mukinbudin Society, 6 competitors.
Nungarin Society, 6 competitors.
Total, 19 competitors.

The rainfall recorded at the various competing centres in this Zone is shown hereunder:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Bencubbin ...	108	54	77	450	7	135	171	168	35	*Nil*	516	115	3	1,323
Karloning (Driver)	*Nil*	29	154	281	7	119	191	216	66	6	605	37	7	1,113
Mukinbudin ...	41	30	164	511	23	124	129	138	90	14	518	44	9	1,317
Lake Brown ...	54	*Nil*	150	407	33	92	170	144	46	4	489	66	10	1,176
Kununoppin ...	53	5	85	507	19	117	234	162	61	*Nil*	593	70	8	1,316
Yelbeni ...	53	51	75	609	50	191	188	195	61	4	589	57	*Nil*	1,434
Nukarni ...	104	14	94	335	19	92	249	184	52	1	597	54	14	1,212
Mangowine ...	36	52	102	568	6	133	207	162	84	6	598	118	4	1,478
Nungarin ...	99	24	107	376	16	114	213	182	80	7	612	71	9	1,298

It was apparent that all crops inspected had been adversely affected by the failure of the Spring rains, which unduly hastened maturity. In view of these unfavourable climatic conditions the yields obtained by the competitors are very gratifying and indicate that sound farming methods are being practised.

KULJA AGRICULTURAL SOCIETY.

The awards made and the cultural details of the competitors are as follow:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Stehn, N. D. ...	Kulja ...	Bencubbin ...	33	8	9	12	14	76
Hodgson, F. ...	Kulja ...	Gluyas Early	22	7	7	12	14	62
Grave, J. ...	Kulja ...	Bencubbin ...	17	9	9	14	12	61
Hodgson, G. R. ...	Kulja ...	Bencubbin ...	16	8	9	14	12	59

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs.			
Stehn, N. D. ...	5	Gimlet and yorrell	June ...	Disc ...	4	Good	Springtyne cultivated in September. Planted with combined cultivator drill with covering harrows attached. Sheep on fallow	15th to 20th April	39	80	Copper carbonate	Yes	
Hodgson, F. ...	5	Mixed yorkgum, gimlet and jam	July ...	Disc ...	4	Good	Disc cultivated in September. Cultivated disc harrows prior to seeding with disc drill	19th to 20th May	40	93	Copper carbonate	Yes	Flagsmut.
Grave, J. ...	6	Salmon gum, gimlet running into wodjil, etc.	July ...	Disc ...	4	Good	Cultivated with springtyne implement in May. Planted with combined cultivator drill; sheep on fallow	1st week in June	45	82	Copper carbonate	Yes	
Hodgson, G. K.	3	Gimlet and tea-tree	July and early August	Ridgidtyne cultivator	3	Good	Crossed cultivated and ridgidtyne cultivated in October and again with the same implement in May. Planted with combined cultivator drill with covering harrows attached	Last week in May	34	93	Copper carbonate	Yes	

MT. MARSHALL AGRICULTURAL SOCIETY.

The following tables show the awards made and the cultural details in connection with the entries through this Society.

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Collins, D. W.	Bencubbin ...	Bencubbin	27	9	9	14	13	72
Perry Bros. ...	North Bencubbin	do.	27	8	9	14	12	70
Hopwood, B. W. G.	Bencubbin ...	do.	25	8	9	14	13	69

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs.			
Collins, D. W.	5	Gimlet, mallee and a little morrel	End of June	Disc ...	4	Good	Cultivated with scarifier first week Sept. and again with same implement before planting with disc drill with covering harrows attached ; sheep on fallow	Last week April	50	90	Copper carbonate	Yes	
Perry Bros. ...	6	Mixed gimlet, salmon gum, jam and mallee	July ...	Disc ...	3	Good	Skimmed with mouldboard plough late July ; tandem disc cultivated end of Sept. and again in April. Planted with combined cultivator drill; sheep on fallow	1st week April,	34	90	Copper carbonate	Yes	
Hopwood, B. W. G.	5	Mallee ...	Early June	Disc ...	3½	Good	Springtyne cultivated in August ; planted with combined cultivator drill; sheep on fallow	1st week May	40	120	*Nil* ...	Yes	

MUKINBUDIN AGRICULTURAL SOCIETY.

The awards made, together with the cultural details of each entry, are given hereunder:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Jolly, S. T. ...	Nungarin	Nabawa ...	28	8	8	13	14	71
Huntington, H. ...	Wilgoyne	Gluyas Early	25	9	7	14	14	69
Stiepwich, W. N. ...	Karloning	Gluyas Early	23	9	8	13	14	67
Manuel, C. J. ...	Mukinbudin	Totadgin ...	23	8	8	13	12	64
Bell, A. J.	do.	Gluyas Early	23	7	7	12	12	61
Shadbolt Bros.	do.	Noongaar ...	21	7	8	13	12	61

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original timber.	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs			
Jolly, S. T. ...	Old land	Salmon gum and gimlet; a little morrel	Late July	Mouldboard	3	Good	Springtyne cultivated in August; harrowed after rain in February, and planted with combined cultivator drill	1st week May...	50	65	*Nil* ...	Yes	A trace of ball smut.
Huntington, H.	Old land	Gimlet and salmon gum, and a little jam	June ...	Disc ...	4	Good	Reploughed in August; cultivated with springtyne late April, and planted with combined cultivator drill with harrows attached	1st week May...	38	80	Copper carbonate	Yes	Flag smut.
Stiepwich, W. N.	4	Gimlet, salmon gum and mallee	Late July	Disc ...	3½	Good	Sprintgyne cultivated late August, again early September, again October; harrowed in December after rain; springtyne cultivated prior to seeding with a combined cultivator drill; sheep on fallow	2nd week May	33	83	Copper carbonate	Yes	A trace of Flag smut.

CULTURAL DETAILS—*continued.*

Competitor.	Years cropped.	Original Timber.	When ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
									lbs.	lbs.			
Bell, A. J. ...	5	Gimlet and salmon gum and black mallee	August	Good	Disc	3ins.	Springtyne cultivated in September and October; disc cultivated prior to seeding	3rd week May	38	70 of 24 %	Re-cleaned	Copper carbonate	Flagsmut
Manuel, C. J. .	About 18	Salmon gum and morrell	June	Good	Mould-board	3ins.	Cultivated with scarifier in August; springtyne cultivated in November: scarified again in May and planted with a combined cultivator-drill with harrows attached. Sheep on fallow.	4th week May	40	84	Yes	Copper carbonate	Trace of Flagsmut
Shadbolt Bros.	6th	Gimlet and salmon gum	July	Good	Ridgidtyne cultivator	3ins.	Cultivated with scarifier late August and planted with combined cultivator-drill. Sheep on fallow.	Middle of May	40	70	Yes	Copper carbonate	A trace of Flagsmut

NUNGARIN AGRICULTURAL SOCIETY.

The awards made and the cultural details of the competing areas are shown in the following tables:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Dunkley, G. A....	Yelbeni ...	Bencubbin ...	32	8	9	12	13	74
Jolly, H. P. ...	Nungarin ...	Nabawa ...	29	8	8	13	14	72
Creagh Bros. ...	Kwelkan ...	Totadgin ...	29	8	8	13	13	71
Evans, L. D. ...	Nukarni ...	Bencubbin ...	24	9	9	14	14	70
Browne, C. T. ...	do.	do. ...	26	8	8	13	13	68
Vernon, G. J. ...	do.	do. ...	23	8	8	14	12	65

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
Dunkley, G. A.	6	Gimlet, salmon gum and mallee	Late July	Disc ...	in. 3½	Good	Scarified twice in Spring and again in early April; planted with Sunderseeder; harrowed 3 or 4 weeks after seed germination	1st week May...	lbs. 45	lbs. 96	Copper carbonate	Yes	
Jolly, H. P. ...	Old land	Salmon gum and gimlet	Early July	Mouldboard	3	Good	Springtyne cultivated in August; harrowed after rain in February; planted with combined cultivator drill with harrows attached	Last week April	50	65	*Nil* ...	Yes	Trace of smut.
Creagh Bros. ...	Old land	Mixed salmon gum, yorrel, and a little mallee	Late June	Disc ...	3	Good	Scarified end of August, again Sept; springtyne cultivated end of April after heavy rain; planted with combined cultivator drill with harrows attached	Early June ...	45	90	Copper carbonate	Yes	Trace of flagsmut.

Competitor.	Years cropped.	Original Timber.	When ploughed.	Condition of land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
Evans, L. D. ...	Old land	Gimlet and Salmon gum	Early June	Good	Mould-board	3ins.	Harrowed July to break lumps; scarified middle August; harrowed after rain at the end of April and planted with combined cultivator drill with harrows attached	Middle of May	lbs. 45	lbs. 110	Yes	Copper carbonate	Very slight trace of Flagsmut
Browne, C. T.	Old land	Gimlet and Salmon gum	June-July	Good	Disc	3ins.	Scarified in September, again in March after rain; planted with combined cultivator drill	1st week May	45	90	Yes	Copper carbonate	Trace of Ball and Flagsmut
Vernon, G. J. ...	Old land	Salmon Gum and mallee	July	Good	Mould-board	3ins.	Disc cultivator end of August, again in October after rain	1st week May	45	90	Yes	Copper carbonate	Slight trace of Flagsmut

ZONE 5.

Judge: F. L. Shier, Senior Agricultural Adviser.

Bruce Rock Society, 6 competitors.
Merredin Society, 10 competitors.
Total, 16 competitors.

The rainfall recorded at the various competing centres in this Zone is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Bruce Rock ...	34	25	207	326	74	184	169	110	57	66	660	109	27	1,388
Yarding ...	10	17	168	240	121	135	178	159	57	66	716	102	23	1,276
Erikin ...	17	21	267	208	133	161	141	153	65	54	707	63	29	1,312
Ardath ...	24	3	188	255	98	156	79	101	43	38	515	73	21	1,079
Merredin ...	78	13	171	447	26	199	238	190	122	44	819	71	17	1,616
Nangeenan ...	45	...	109	419	28	172	164	153	59	33	609	73	14	1,269
Burracoppin ...	30	66	117	439	14	120	202	171	85	38	630	55	*Nil*	1,337
Belka	61	25	145	380	68	186	189	182	29	44	698	63	24	1,396
Baandee ...	50	16	100	515	48	183	121	150	64	4	570	56	3	1,310

BRUCE ROCK AGRICULTURAL SOCIETY.

The following tables show the awards made and the cultural details of the competing areas:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Smith, C, & Sons ...	Yarding ...	Gluclub ...	35	9	9	13	13	79
Negri, D.	Bruce Rock ...	do. ...	31	8	9	13	13	74
Jones, R.	Erikin ...	do. ...	29	9	8	13	14	73
Breakell, T. E. ...	Ardath ...	do. ...	26	9	8	13	14	70
Pollock, R.	Belka ...	Noongaar ...	24	9	9	14	13	69
Allen Bros.	Bruce Rock ...	Totadgin ...	23	9	9	13	13	67

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Smith, C. & Sons	23	Gimlet and salmon gum	End June	Wet	Rigidtyne scarifier	...	Scarified twice; disc cultivated end of Sept.; springtyne cultivated and rigid tyne cultivated after March rains. Planted with combined cultivator drill	Early May ...	45	93	Yes	Dry ...	Odd loose smut.
Negri, D. ...	18—20	Gimlet and salmon gum	June ...	Fairly wet	Disc and mould-board	3 3½	Cultivated three times after ploughing during spring and again after heavy rains. Planted with combined cultivator drill	1st week May	40	110	Yes	Dry	
Jones, R. ...	About 20	Salmon gum and gimlet	June ...	Wet	Disc cultivator	3–3½	Cultivated July and again September; cultivated twice after March rains. Planted with combined cultivator drill	Mid-May ...	50	72	Yes	...	Trace of flag smut and ball smut
Breakell, T. E.	About 20	Salmon gum	August ...	Fairly wet	Mouldboard	3–3½	Cultivated October; again after March rains. Planted with combined cultivater drill	1st week May	45	80	Yes	Dry ...	Trace of loose smut and ball smut
Pollock, R. ...	Old land	Salmon gum and gimlet	Early June	Wet	Disc ...	3	Springtyne and rigid tyne cultivated during Spring; cultivated twice after March rains, and later reploughed before planting with combined cultivator drill	1st week June	45	90	Yes	Dry ...	Trace of flag smut
Allen Bros. ...	3 or 4	Salmon gum and gimlet	June ...	Wet	Disc ...	3	Rigid tyne cultivated September, and springtyne cultivated early October. Planted with combined cultivator drill	3rd week May	50	95	Yes	Dry ...	Trace of takeall.

MERREDIN AGRICULTURAL SOCIETY.

The awards made and the cultural details of the competing areas are shown below:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Mussared, R. T. ...	Belka	Bencubbin ...	29	8	9	14	13	73
Flockhart, I. H. ...	Merredin ...	Totadgin ...	27	9	9	14	13	72
Reichelt, E. E. ...	Burracoppin	do. ...	26	9	9	14	13	71
Horobin, E. A. & O.	Nangeenan	Bencubbin ...	27	8	9	14	12	70
Teasdale, F. O. ...	Korbel ...	Totadgin ...	27	8	8	14	13	70
Smallacombe, J. T.	Merredin ...	Gluyas Early	24	9	7	14	14	68
Lambert, J. B. ...	Burracoppin	Puse ...	24*	9	8	13	14	68
Cook, W. T. ...	do. ...	Totadgin ...	24	9	8	13	13	67
Crouch, W. S. ...	do. ...	Merredin ...	23	9	7	14	13	66
Kaye, John ...	Baandee ...	Totadgin ...	18	8	9	14	14	63

* This figure includes an allowance of 10 per cent. for a premium variety.

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lb.	lb.			
Mussared, R. T.	Old land	Salmon gum	July ...	Dry	Disc ...	3½	Cultivated twice during Spring and twice after rains before planting with combined cultivator drill	2nd week May	50	120	Yes	Dry.	
Flockhart, I. H.	Old land	Salmon gum	June ...	Hard	Disc ...	3	Reploughed and cultivated late Spring, and cultivated twice after March rains. Planted with combined cultivator drill	1st week June	45	90	Yes	Dry	
Reichelt, E. E.	8–10	Salmon gum and gimlet	Mid-June...	Fairly wet	Disc ...	3½	Rigid tyne cultivated end July and end of August, and harrowed after each cultivation. Rigid tyne cultivated about end of April. Planted with combined cultivator drill	Mid-June ...	53	93	Yes	Dry	

CULTURAL DETAILS—*continued.*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Horobin, E. A. & O.	Old land	Salmon gum and gimlet	July ...	Good	Disc ...	4	Rigid tyne cultivated September, and cultivated after heavy rains. Planted with combined cultivator drill	1st week May	45	90	Yes	Dry	
Teasdale, F. O.	Old land, 20 years	Salmon gum and gimlet	1st week July	Wet	Mouldboard	3	Springtyne cultivated twice in Spring; twice after heavy March rains. Planted with combined cultivator drill	3rd week May	45	112	Yes	No ...	Trace flag smut and ball smut.
Smallacombe, T.	Old land	Gimlet ...	End June...	Wet	Mouldboard	3–3½	Disced back August; cultivated September, again March after rains; disced May. Planted with combined cultivator drill	Last week May	53	93	Yes	Dry	
Lambert, J. B.	7	Salmon gum and gimlet	June ...	Good	Disc ...	3	Cultivated three times during Spring and again after heavy rains. Planted with cultivator drill	1st week June	35	93	Yes	Dry ...	Trace of takeall.
Cook, W. T. ...	Old land	Salmon gum	July ...	Fair	Disc ...	3	Cultivated August, September, and after heavy rains, and again at seeding with combined cultivator drill	3rd week May	45	112	Yes	Dry ...	Trace of takeall.
Crouch, W. L.	10	Salmon gum and gimlet	June ...	Fair	Mouldboard	4	Cross-disced August; cultivated twice before planting with combined cultivator drill	End of May ...	50	110	Yes	Dry ...	Trace of ball smut, flag smut, loose smut.
Kaye, John ...	Old land	Mixed salmon gum, gimlet, york gum and morrel	July ...	Inclined to dry side	Mouldboard	3½–4	Rigid tyne cultivated September; springtyned October; harrowed December; springtyned after heavy rains and scarified before planting with combined cultivator drill	1st week June	50	100	Yes	Dry	

ZONE 7.

Judge: A. S. Wild, Senior Agricultural Adviser.

Kulin Society, 10 competitors.
Harrismith Society, 5 competitors.
Karlgarin Society, 14 competitors.
Lake Grace Society, 8 competitors.
Kukerin Society, 10 competitors.
Total, 47 competitors.

Although very light spring rains had been experienced in the districts visited, the yields of the competing areas and crops were very gratifying and reflected the very sound farming methods practised by the farmers concerned. Not only were the 50-Acre Competition areas of a very high standing, but many instances were seen where the whole area cropped on the farm would yield in the region of seven bags. When harvesting was proceeding, higher yields were being obtained than was anticipated. The quality of the grain being stripped was generally very good. In some cases there was a slight pinching of the grain but the colour was excellent.

Another pleasing feature noticed during the inspection was the large areas of oats being grown. Oats undoubtedly are an essential part of the wheat belt rotations for the prevention of such diseases as take-all and are also very suitable for the feeding of all farm stocks. With the increasing number of sheep on the wheat farms it is necessary to have some reserves of feed for supplementary feeding during the summer months. Oats are particularly valuable and suitable for this purpose.

KULIN AGRICULTURAL SOCIETY.

The rainfall recorded at the stations concerned is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Kulin	7	22	396	210	294	227	255	156	100	37	1,069	112	18	1,834
Kulin Rock ...	35	3	323	176	152	194	175	182	113	20	836	109	8	1,490

The awards made and the cultural details of the competing areas are shown hereunder:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease. 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Freebairn, F. S. ...	Jilakin ...	Gluclub ...	36	9	9	12	13	79
Scadding, N. A. ...	do. ...	Bencubbin ...	33	9	9	12	13	76
Bailey & Russell ...	Kulin Rock ...	do. ...	33	8	8	13	13	75
Hodgson, H. J. ...	Jilakin ...	Gluclub ...	35	8	6	12	13	74
Hortin, C. F.	Kulin	do. ...	31	9	8	13	13	74
Nichols, R. & Sons ...	Kulin Rock ...	do. ...	30	9	8	13	14	74
Lee, J. E.	Jilakin ...	Bencubbin ...	30	9	8	13	13	73
Bele, J. H.	Kulin Rock ...	Gluclub ...	29	7	9	13	12	70
Freebairn & Kemp ...	do. ...	do. ...	29	8	7	12	12	68
Bowey, P. J.	Kulin	Pusa ...	19	8	8	11	12	58

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Freebairn, F. S.	Old land	Salmon gum and morrell	Early in June	Good	Disc ...	3	Rigidtyne cultivated in mid-September. Springtyne cultivated in mid-October and portion again in April. Planted with combined cultivator drill with light drag harrows attached	2nd week in April	60	112	Copper carbonate	Yes	Trace of rust.
Scadding, N. A.	4	Morrel, tea-trea, and blackbutt	Late in June	Fair	Disc ...	3	Springtyne cultivated in September. Harrowed after rain in March and again just before seeding	4th week in April	70	100	Copper carbonate	Yes	Little takeall.
Russell & Bailey	Old land	Salmon gum and gimlet	July ...	Good	Disc ...	3½	Disc cultivated 2½in. deep early in September. Springtyne cultivated in March. Planted with combined plough drill	1st week in May	45	90	Copper carbonate	Yes	Traces of takeall and rust.
Hodgson, H. ...	Old land	Salmon gum, gimlet, morrel, boree	Early in July	Good	Rigidtyne scarifier	3	Rigidtyne cultivated in September. Harrowed in March. Planted with combined cultivator drill with light drag harrows attached	4th week in April	50	90	Copper carbonate	Yes	Takeall and flag smut and trace of flying smut.
Hortin, C. F. ...	3	Salmon gum, tea - tree, blackbutt, yorkgum, morrel	July ...	Good	Rigidtyne scarifier	4	Rigidtyne cultivated in September. Planted with combined cultivator drill with light drag harrows attached	4th week in April	50	90	Copper carbonate	Yes	Flag smut and traces of takeall and flying smut.
Nichols, R. & Sons	7	Salmon gum and mallee	June ...	Good	Disc ...	3	Disc cultivated 2in. deep in August: portion rigidtyne cultivated in September and all in March. Planted with combined cultivator drill with light drag harrows attached	1st week in May	60	100	Copper carbonate	Yes	Traces of takeall, flag smut and flying smut.

CULTURAL DETAILS—*continued.*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Lee, J. E. ...	Old land	Salmon gum morrel	July ...	Fair	Mouldboard	2–3	Mouldboard ploughed 2in. to 3in. deep in September and harrowed just after. Planted with combined cultivator drill with light drag harrows attached	2nd week in May	55	90	Copper carbonate	Yes	Flag smut and a little takeall.
Bele, J. H. ...	Old land	Gimlet, salmon gum, morrel	June ...	Hard	Mouldboard	3	Springtyne cultivated late September and again in March. Planted with combined cultivator drill with light drag harrows attached	1st fortnight in May	50	90	Copper carbonate	Reclean	Trace of flying smut.
Freebairn & Kemp	Old land	Gimlet, malee, salmon gum	Late in July	Good	Disc ...	3	Rigidtyne cultivated in September. Planted with combined cultivator drill with light drag harrows attached and springtyne cultivated immediately after	4th week in April	60	90	Copper carbonate	Yes	Takeall, flag smut, and trace of flying smut.
Bowey, P. J. ...	2	Salmon gum	June ...	Wet	Mouldboard	3	Rigidtyne cultivated in April. Planted with combined cultivator drill	1st week in May	50	90	Copper carbonate	Yes	Little takeall and trace of flying smut.

HARRISMITH AGRICULTURAL SOCIETY.

The rainfall recorded at the stations concerned is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total. for Year.
Harrismith ...	10	14	430	164	223	270	189	206	79	32	999	64	28	1,709
Tinkurrin ...	67	53	251	157	138	219	268	208	45	63	941	52	15	1,536

The awards made and the cultural details of the competing areas are shown hereunder:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Murray, A.	Tinkurrin ...	Totadgin ...	28	8	8	14	13	71
Ballard, B.	do. ...	Bencubbin ...	28	7	9	13	13	70
Abbott, J.	do. ...	do. ...	27	7	9	13	12	68
Parnell, F. G. ...	do. ...	do. ...	25	7	9	14	13	68
Dare Bros.	Harrismith ...	Nabawa ...	25	8	9	11	13	66

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Murray, A. ...	3	Salmon gum, morrel, jam	August ...	Good	Mouldboard	4	Rigidtyne cultivated in October, again in March, and again in April. Planted with combined cultivator drill	Late in May ...	50	90	Yes	Copper carbonate	Takeall.
Ballard, B. ...	5	Salmon gum, jam, morrel, etc.	Late in July	Good	Mouldboard	3½	Disc cultivated 2½ins. deep just before seeding	2nd week in May	50	90	Yes	Copper carbonate	
Abbott, J. ...	3	Salmon gum and morrel	September	Good	Mouldboard	4	Springtyne cultivated in April and planted with combined cultivator drill	Mid-May ...	60	100	Yes	Bluestone	
Parnell, F. G.	Old land	Salmon gum and yorkgum, morrel, mallee	Early in July	Good	Mouldboard	3½	Disc cultivated 2ins. deep in September. Mouldboard ploughed just before seeding and disc cultivated just after seeding	Late in May ...	58	90	Yes	Formalin	
Dare Bros. ...	Old land	Salmon gum, morrel, yorkgum, mallee	Late in July	Good	Mouldboard	3	Mouldboard ploughed 2ins. deep and springtyne cultivated just before seeding	3rd week in May	43	87	Yes	Copper carbonate	Little flying smut.

KARLGARIN AGRICULTURAL SOCIETY.

The rainfall recorded at the stations concerned is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Karlgarin ...	5	16	158	219	95	197	259	155	92	47	845	98	15	1,356
Kondinin ...	10	30	215	198	163	176	273	143	77	25	857	92	21	1,423
Bendering ...	15	22	162	161	158	174	221	143	72	35	803	79	16	1,258
Hyden ...	17	55	223	203	84	171	273	165	107	79	879	120	23	1,519
North Hyden ...	50	3	159	97	147	162	221	216	96	123	965	19	58	1,351

The awards made and the cultural details are shown in the accompanying table:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Grant, L. J.	Karlgarin ...	Totadgin ...	31	8	8	14	13	74
Parsons, F.	Kondinin ...	Bencubbin ...	30	8	9	12	14	73
James, S. W.	Karlgarin ...	do. ...	28	8	9	13	13	71
Biglin, D. A. ...	do. ...	Totadgin ...	26	8	9	14	13	70
Smith, W. G.	Bendering ...	Bencubbin ...	27	9	9	13	12	70
Biglin, E. J.	Karlgarin ...	Totadgin ...	25	8	9	14	13	69
Ray, J. G.	do. ...	Gluyas Early	25	9	8	12	14	68
Shawyer, C.	do. ...	Bencubbin ...	28	7	7	14	12	68
Marshall, H. J. ...	Hyden ...	do. ...	23	9	8	14	13	67
Treasure, C. W. ...	Karlgarin ...	do. ...	26	8	8	13	12	67
Clayton, R. G. ...	North Hyden...	do. ...	23	8	8	14	13	66
Stubbs, W.	Kondinin ...	Gluclub ...	24	8	8	12	14	66
Green & Atkinson ...	North Hyden	Totadgin ...	21	8	9	13	12	63
Lynch, T. A.	Hyden ...	Bencubbin ...	21	8	8	14	12	63

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lb.	lb.			
Grant, L. J. ...	3	Salmon gum, gimlet, mallee	June-July...	Good	Disc ...	3–4	Springtyne cultivated in August and again in April. Planted with combined cultivator drill	Mid-May ...	34	90	Copper carbonate	Yes	Little takeall.
Parsons, F. ...	Old land	Salmon gum and gimlet	June ...	Good	Mouldboard	3	Springtyne cultivated in August, again late in September and again late in March. Planted with combined cultivator drill with light drag harrows attached	1st week in May	50	90	Copper carbonate	Yes	Trace of takeall.
James, S. W....	7	Salmon gum, gimlet, mallee, york gum	March-April	Dry	Disc ..	2	Disc cultivated 3in. deep late in July, and again 2in. deep late in September; springtyne cultivated three times after March rains. Planted with combined cultivator drill	3rd week in May	39	75	Copper carbonate	Yes	Trace of takeall.
Biglin, D. A....	4	Gimlet and salmon gum	June ...	Fair	Rigidtyne scarifier	2½	Rigidtyne cultivated in August; springtyne cultivated in September, and again after March rains; rigid tyne cultivated just before seeding. Planted with combined cultivator drill with light drag harrows attached.	4th week in May	45	100	Copper carbonate	Yes	Trace of takeall.
Smit' W. G....	2	Salmon gum and gimlet	Early in July	Good	Disc ...	3½	Rigidtyne cultivated in spring; springtyne cultivated twice in September and October. Planted with combined cultivator drill with light drag harrows attached	1st week in May	48	103	Copper-carbonate	Yes	
Ray, J. G. ...	5	Salmon gum gimlet, mallee	June ...	Good	Rigidtyne scarifier	2½	Rigidtyne cultivated 2½in. deep in September, and again just before seeding	3rd week in May	45	90	Copper carbonate	Yes	Flag smut.
Biglin, E. J. ...	4	Gimlet and salmon gum	June ...	Fair	Rigidtyne scarifier	2½	Rigidtyne cultivated in August; springtyne cultivated in September, and again in March; rigid tyne cultivated just before seeding. Planted with combined cultivator drill with light drag harrows attached	4th week in May	45	100	Copper carbonate	Yes	Trace of takeall.

CULTURAL DETAILS—*continued*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lb.	lb.			
Shawyer, C. ...	4	Salmon gum, gimlet, morrel	October	Fair	Disc ...	3	Springtyne cultivated just before seeding. Planted with combined cultivator drill	1st week in April	60	90	Copper carbonate	Yes	Traces of ball smut, takeall, flag smut septoria and rust.
Marshall, H. J.	1 and 2	Salmon gum and gimlet	July ...	Good	Disc ...	3½	Springtyne cultivated in September. Planted with combined cultivator drill	Late in April and early in May	38	70	Copper carbonate	Yes	Septoria.
Treasure, C. W.	4	Salmon gum, gimlet, mallee	July ...	Good	Disc ..	3	Rigid tyne cultivated late in August, and twice again just prior to seeding. Planted with combined cultivator drill	3rd week in May	45	90	Copper carbonate	Yes	
Clayton, R. G.	4	Salmon gum, mallee, gimlet	Late in June	Good	Springtyne cultivator	2½	Springtyne cultivated in August. Planted with combined cultivator drill with light drag harrows attached	Mid-April ...	40	70	Copper carbonate	Yes	Little takeall.
Stubbs, W. ...	9	Salmon gum, gimlet, jam, mallee	Early in June	Good	Disc ...	3	Springtyne cultivated mid-September; again in March and again in early April; light harrows attached to disc drill	2nd week in April	45	90	Copper carbonate	Yes	Traces of septoria, flying smut and rust.
Green & Atkinson	3	Salmon gum, mallee, gimlet, tea-tree	June ..	Good	Springtyne cultivator	2½	Springtyne cultivated mid-October; portion rigid tyne scarified and remainder springtyne cultivated just prior to seeding. Planted with combined cultivator drill	Mid-May ...	45	90	Copper carbonate	Yes	
Lynch, T. A....	4	Salmon gum, morrel, mallee	July ...	Good	Disc ...	4	Springtyne cultivated September, and again in November. Planted with combined cultivator drill with light drag harrows attached	2nd week in May	43	90	Copper carbonate	Yes	Little takeall and trace of flag smut.

LAKE GRACE AGRICULTURAL SOCIETY.

The rainfall recorded at the several stations concerned is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Lake Grace ...	38	27	467	159	189	189	273	182	151	77	1,061	88	23	1,863
Lake Biddy ...	*Nil*	19	282	150	144	197	330	162	87	56	976	75	7	1,509
Burngup ...	8	18	262	142	175	159	309	172	103	77	995	94	38	1,557

The awards made and the cultural details are as follow:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Coad, H. J.	Lake Grace ...	Bencubbin ...	37	8	8	14	14	81
Carruthers, H. F. ...	Lake Grace ...	Waratah ...	31	9	9	13	14	76
Stewart, D. McL. ...	Lake Biddy ...	Bencubbin ...	30	9	8	14	14	75
Bishop, H. F. ...	Lake Grace ...	Waratah ...	31	8	8	13	13	73
Witham & Sons ...	Lake Biddy ...	Bencubbin ...	28	9	8	14	13	72
Bishop, S. J. ...	Lake Grace ...	Totadgin ...	26	8	8	14	14	70
Collinson & Fleay ...	Burngup ...	Gluclub ...	28	8	6	12	13	67
Curwood, H. W. F.	Lake Biddy ...	Bencubbin ...	22	7	8	14	14	65

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Coad, H. J. ...	6	Yorrel and gimlet	July ...	Fair	Disc ...	3	Disc cultivated 3in. deep in September. Planted with combined cultivator drill with light drag harrows attached	Late in April ...	45	150	Copper carbonate	Yes	Little takeall and rust.
Carruthers, H. F.	Old land	Salmon gum and gimlet	July-August	Good	Mouldboard	3½	Springtyne cultivated in September and again in March. Planted with combined cultivator drill with light drag harrows attached	Late in April and early in May	73	150	Copper carbonate	Yes	Trace of flag smut.
Stewart, D. McL.	Old land	Morrel, yorrel, blackbutt	July-August	Good	Disc ...	4	Springtyne cultivated late in March. Light drag harrows attached to disc drill	3rd week in April	45	92	Copper carbonate	No	Traces of flying smut and septoria.
Bishop, H. F.	6	Blackbutt ...	July ...	Good	Disc ...	2½–3	Rigidtyne cultivated in October and again in April. Planted with combined plough drill	3rd week in May	40	110	Copper carbonate	Yes	Flying smut and traces of flag smut and rust.
Witham & Sons	6	Salmon gum and mallee	July ...	Good	Disc ...	3–4	Disc cultivated 2in. deep early in September. Springtyne cultivated early in October and again just before seeding	2nd week in May	40	80	Copper carbonate	Yes	Traces of rust and septoria.
Bishop, S. J. ...	Old land	Salmon gum, gimlet, morrel	July ...	Hard	Mouldboard	2½	Disc cultivated 3in. deep late in August. Springtyne cultivated in March and again just before seeding. Planted with combined cultivator drill	4th week in May	45	112	Copper carbonate	Yes	Traces of ball smut and flying smut.
Collinson & Fleay	3	Salmon gum, morrel, gimlet, yorrel	Late in August	Good	Disc ...	3	Springtyne cultivated just before seeding	Mid-May ...	50	90	Copper carbonate	No	Ball smut, flag smut and trace of flying smut.
Curwood, H. W. F.	Since 1923	Morrel, boree, yorrel	July-August	Powdery	Disc ...	3½	Springtyne cultivated seven times after rain in each case	1st week in May	55	120	Copper carbonate	Yes	Takeall.

KUKERIN AGRICULTURAL SOCIETY.

The rainfall recorded at the stations concerned is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total. for Year.
Kukerin ...	17	41	429	173	137	222	311	232	118	73	1,093	72	23	1,848

The awards made and the cultural details of the competing areas are as follow:

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Williams, T. C. ...	South Kukerin	Bencubbin ...	32	8	9	14	13	76
Adams, E.	do. ...	Yandilla King	33	7	8	13	13	74
English, C. E. ...	do. ...	do. ...	30	8	8	13	13	72
Pyke, G.	Kukerin ...	Gallipoli ...	28	8	8	13	13	70
Bahr, E. O.	South Kukerin	Yandilla King	27	8	8	12	13	68
Gard, W. O.	do. ...	Waratah ...	27	7	8	13	12	67
Smith, I.	Kukerin ...	Gluclub ...	26	7	8	13	12	66
Faulkner, W. J. ...	North Kukerin	Bencubbin ...	25	7	8	13	12	65
Sugg Bros.	do. ...	Gluyas Early	20	7	9	12	12	60
Joyce, F.	do. ...	Bencubbin ...	17	6	9	13	11	56

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Williams, T. C.	Old land	Salmon gum, mallee, jam, morrel	July ...	Good	Mouldboard	3–3½	Disc cultivated 9in. deep late August; springtyne cultivated late September, and four times again after March rains. Planted with combined cultivator drill	Late May ...	50	100	Copper carbonate	Yes	Traces of rust and flying smut
Adams, E. ..	Old land	Salmon gum, gimlet and morrel	June-July	Good	Mouldboard	3½–4	Springtyne cultivated late August, and again early October; harrowed after March rains: springtyne cultivated late March, and again early April; harrowed just before seeding. Planted with combined cultivator drill	1st week May	45	90	Copper carbonate	Yes	Little takeall and traces of rust and flying smut
English, C. E.. .	3	Jam and yorkgum	June–July	Good	Mouldboard	3	Rigidtyne cultivated September; springtyne cultivated early October; rigidtyne cultivated March. Planted with combined cultivator drill with light drag harrows attached	1st week May	42	110	Copper carbonate	Yes	Little takeall and trace of rust
Pyke, G. ...	Old land	Jam and yorkgum	July ...	Good	Mouldboard	4	Worked with mouldboard plough in September, and again in April; rigidtyne and also springtyne cultivated in May	4th week May	45	112	Copper carbonate	Yes	Little takeall and flying smut

CULTURAL DETAILS—*continued.*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Bahr E. O. ...	Old land	Salmon gum	July ...	Good	Mouldboard	3	Disc cultivated 2in. deep in March; springtyne cultivated in April. Planted with combined cultivator drill	1st week May	45	45	Copper carbonate	Yes	Little takeall
Gard. W. B. ..	Old land	Salmon gum, morrel, mallee	Early July	Good	Disc ..	3	Rigidtyne cultivated in March. Planted with combined cultivator drill	Late May ..	45	90	Copper carbonate	Yes	Flying smut and traces of takeall and septoria
Smith, S. ..	Old land	Morrel and gimlet	July ...	Good	Mouldboard	4	Rigidtyne cultivated in September, and again late March. Planted with combined cultivator drill with light drag harrows attached	Mid-May ...	55	90	Copper carbonate	Yes	Little takeall and trace of flying smut
Faulkner, W. J.	Old land	Salmon gum	July ...	Fair	..	3	Springtyne cultivated in April, and again in May. Planted with combined cultivator drill	3rd week May	50	90	Copper carbonate	No	Takeall
Sugg Bros. ...	Old land	Morrel, mallee, boree, gimlet etc.	August ...	Good	Mouldboard	2½	Springtyne cultivated late September. Planted with combined cultivator drill with light drag harrows attached	2nd week May	45	75	Copper carbonate	Yes	Trace of takeall
Joyce, F. ...	Old land	Salmon and york gums	June ..	Good	Mouldboard	3-4	Mouldboard ploughed 2in. deep in early September, and again just before seeding; harrowed immediately after planting	2nd week May	50	90	Copper carbonate	Yes	Trace of takeall

ZONE 8.

Judge: N. Davenport, Senior Agricultural Adviser.

Royal Society, 1 competitor.
Wickepin Society, 3 competitors.
Gnowangerup Society, 6 competitors.
Total, 10 competitors.

The rainfall at the various competing centres of this Zone is as follows:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total. for Year.
South Caroling	95	3	449	168	139	225	149	120	71	74	778	75	15	1,583
Wickepin ...	65	81	327	190	171	313	255	223	83	49	1,094	99	11	1,867
Gnowangerup...	62	4	616	120	177	261	260	161	108	106	1,073	75	28	1,978
Borden ...	40	12	557	132	139	117	328	160	116	133	1,053	180	51	2,025
Formby ...	79	13	532	114	168	228	256	150	100	94	996	99	39	1,872

Considering the type of season experienced in this Zone, the yields obtained were very creditable and indicated the high standard of farming practised by the respective competitors.

A very wet seeding period occurred and considerable work was necessary to keep the prolific growth of weeds in check. Light spring rains affected the yields somewhat, although crops were yielding higher than was anticipated. Traces of rust were visible in most crops, but only in one or two instances were badly affected crops seen.

WICKEPIN AGRICULTURAL SOCIETY.

The awards made and the cultural details of the respective competing areas are as follow:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Fleay, E. H. & Sons	Wickepin ...	Graham ...	30	7	8	14	12	7
Hosken Bros.	do. ...	Free Gallipoli	23	9	9	14	13	68
Doncon, E. R. ...	do. ...	Canberra ...	24	8	8	14	13	67

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
						in.			lbs.	lbs.			
Fleay, E. H. & Sons	Old land	Morrel, little salmon gum and yorkgum	July ...	Good	Mouldboard	4–4½	Springtyne cultivated after rain in March. Planted with disc drill	Last week in April	52	80	Copper carbonate	Yes	Takeall.
Hosken Bros.	Old land	Morrel and mallee	August ...	Good	Mouldboard	3–3½	Springtyne cultivated end October ; early November ; again after rain in March. Planted with combined cultivator drill with drag harrows attached	Last week in April	60	112	Formalin...	Yes	Little flag smut.
Doncon, E. R.	Old land	Yorkgum, little mallee	End July	Fair	Mouldboard	3	Springtyne cultivated prior to planting with disc drill	Mid-May ...	45	90	Copper carbonate	Yes	Little takeall.

GNOWANGERUP AGRICULTURAL SOCIETY.

The awards made and the cultural details of the competing areas are as follow:

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Cockram, C. ...	Pallinup ...	Free Gallipoli	40	9	9	14	13	85
MacDonald, J. ...	Gnowangerup	Bencubbin ...	35	9	9	14	13	80
Griffiths, H. ...	do. ...	do. ...	35	9	7	14	13	78
Glengarry Estate ...	do. ...	Free Gallipoli	32	8	8	14	13	75
McLennan, Estate	Borden ...	Bena ...	33	9	7	12	14	75
Wellard & Wellard	Gnowangerup	Bencubbin ...	32	9	8	14	12	75

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lb.	lb.			
Cockram, C. ...	Old land	Yorkgum, morrel, and a little whitegum	July-August	Fair	Mouldboard	3	Springtyne cultivated in September and October. Harrowed and cultivated in April and May. Planted with combined cultivator drill	Last week in May	60	150	Yes	Copper carbonate	Trace of takeall and foot rot.
MacDonald, J.	Four	Salmon gum, morrel, and yorkgum	End of July and early in August	Good	Mouldboard	3–3½	Springtyne cultivated in October, February, and April. Planted with combined cultivator drill and harrowed after	End of May ...	55	100	Yes	Copper carbonate	Foot rot and trace of rust.

CULTURAL DETAILS.—*continued.*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lb.	lb.			
Griffiths, H. ...	Old land	Salmon gum, yorkgum, and mort	July-August	Very fair	Mouldboard	2½-3	Harrowed after fallowing. Rigidtyne cultivated in autumn, followed by springtyne cultivator; again cultivated and harrowed prior to planting with combined cultivator drill	1st week in June	58	100	Yes	Copper carbonate	Foot rot.
Glengarry Estate	Old land	... ...	Early in July	Good	Mouldboard	3	Springtyne cultivated in October and March, and three times between then and end of May. Planted with combined cultivator drill	2nd week in June	48	112	Yes	Vitrioline...	Foot rot.
McLennan Estate	Old land	Yorkgum and jam	Early in September	Very dry	Mouldboard	3	Disc ploughed end of September. Springtyne cultivated end of October and early in April; again prior to planting with disc drill	1st week in June	45	100	Yes	Smutol ...	Rust, a little takeall and foot rot.
Wellard & Wellard	Old land	Salmon gum and manna gum	June-July	Good	Mouldboard	3	Springtyne cultivated in September and October, and after March rains: again in May. Planted with combined cultivator drill	Early in June	60	90	Yes	Copper carbonate	Foot rot.

ROYAL AGRICULTURAL SOCIETY.

The awards made and the cultural details of the competing area of the single competitor entering direct with the parent body are given below:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Richards, A. ...	South Caroling	Gluclub ...	36	9	9	14	13	81

CULTURAL DETAILS.

Competitor.	Years Cropped	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Richards, A. ...	Old land	Gimlet, morrel, yorkgum	July-August	Good	Mouldboard	3½	Springtyne cultivated in September and October. Planted with combined cultivator drill	2nd week June	52	125	Yes	Copper carbonate	

ZONE 9.

Judge: A. S. Wild, Senior Agricultural Adviser.

Phillips River Society, 4 competitors.

PHILLIPS RIVER AGRICULTURAL SOCIETY.

The rainfalls recorded at Ravensthorpe and Mt. Short are as follow:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Ravensthorpe...	38	23	273	240	71	212	354	177	163	93	1,070	126	48	1,818
Mt. Short ...	16	9	211	260	52	189	311	147	162	84	945	154	37	1,632

All the crops inspected in the Ravensthorpe area showed evidence of rust, but fortunately not seriously. The one withdrawal, however, was occasioned by the entrant's crop being very badly affected by this disease.

The yields of the competing crops in this district indicate considerable improvement in farming practice since crop competitions were first inaugurated there in 1928. In that year a 25-acre competition was held and the yields ranged from 17 bushels to 8 bushels.

The awards made and the cultural details are as hereunder:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Chambers Bros. ...	Ravensthorpe	Bencubbin ...	28	7	8	14	13	70
Barrett, M.	do. ...	do. ...	27	8	8	13	13	69
Campbell, J.	Mt. Short ...	do. ...	25	8	8	14	12	67
Bebbington Bros. ...	do. ...	do. ...	21	9	7	14	12	63

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber.	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Chambers Bros.	Old land	Gimlet and salmon gum	June and July	Good	Mouldboard	3½–4	Springtyne cultivated in September and again in early March. Planted with combined cultivator drill with light drag harrows attached	Mid-May ...	43	60	Yes	Copper carbonate	Rust, a little takeall and septoria.
Barrett, M. ...	3	Chiefly mallee and gimlet	Early in July	Good	Disc ...	4	Springtyne cultivated in mid-October and twice again just before seeding. Planted with combined cultivator drill	4th week in May	45	90	Yes	Copper carbonate	Rust.
Campbell, J. ...	Old land	Jam, salmon gum, mallee	Early in June	Good	Mouldboard	3½	Springtyne cultivated after rain in late November. Portion disc cultivated in January. All springtyne cultivated just before seeding	Early in May ...	45	60	Yes	Copper carbonate	Rust.
Bebbington Bros.	4	Chiefly mallee	Late in June and early in July	Fair	Mouldboard and disc	3½	Springtyne cultivated in September. Planted with combined cultivator drill	2nd week in May	45	90	No	Copper carbonate	Trace of flying smut, a little takeall, septoria, and rust.

ROYAL AGRICULTURAL SOCIETY ZONE CHAMPIONSHIP AWARDS.

Representatives from District Agricultural Societies' competitions and entries received direct by the Royal Agricultural Society.

Competitor.	Address.	Society.	Variety.	Yield. 50 pts.	Freedom from Weeds. 10 pts.	Freedom from Disease. 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total. 100 pts.
ZONE 1.—Judge: G. L. Throssell, Agricultural Adviser.									
Bothe, B. D.	Coorow ...	Carnamah	Bencubbin	37	8	8	14	13	80
Rudduck, A.	Coorow ...	Carnamah	Bencubbin	34	9	8	14	13	78
Williamson, A. M.	Three Springs	Three Springs	Merredin	33	9	8	13	14	77
ZONE No. 2.—Judge: G. L. Throssell, Agricultural Adviser.									
Moore, Hon. T.	Indarra ...	...	Merredin	32	9	8	14	14	77
Sutcliffe, J. & G.	E. Damboring	...	Bencubbin	31	9	8	13	14	75
Baxter, E. ...	Perenjori ...	...	Merredin	27	9	9	13	14	72
Rumble, M. & E. J.	Mullewa ...	...	Gluclub ...	31	8	7	12	13	71
O'Brien, J. J.	Mullewa ...	...	Bencubbin	26	8	7	13	13	67
ZONE No. 3.—Judge: R. P. Roberts, Agricultural Adviser.									
Jones, D. D.	Wyalkatchem	Wyalkatchem	Bencubbin	31	9	9	13	14	76
Threlfall, H.	Korrelocking	Wyalkatchem	Bencubbin	27	9	8	14	13	71
Mt. Rupert Estate	Wongan Hills	Royal ...	Gluclub ...	29	7	8	12	13	69
ZONE No. 4.—Judge: I. Thomas, Superintendent of Wheat Farms.									
Stehn, N. D.	Kulja ...	Kulja ...	Bencubbin	33	8	9	12	14	76
Dunkley, G. A.	Yelbeni ...	Nungarin	Bencubbin	32	8	9	12	13	74
Jolly, H. P.	Nungarin ...	Nungarin	Nabawa	29	8	8	13	14	72
Collins, D. W.	Bencubbin...	Mt. Marshall	Bencubbin	27	9	9	14	13	72
Jolly, S. T.	Nungarin ...	Mukinbudin	Nabawa	28	8	8	13	14	71
Perry Bros.	N. Bencubbin	Mt. Marshall	Bencubbin	27	8	9	14	12	70
Huntington, H.	Wilgoyne ...	Mukinbudin	Gluyas Early	25	9	7	14	14	69
Hodgson, F.	Kulja ...	Kulja ...	Gluyas Early	22	7	7	12	14	62
ZONE No. 5.—Judge: F. L. Shier, Senior Agricultural Adviser.									
C. Smith & Sons	Yarding ...	...	Gluclub ...	35	9	9	13	13	79
Negri, D. ...	Bruce Rock	...	Gluclub ...	31	8	9	13	13	74
Mussared, R. T.	Belka ...	...	Bencubbin	29	8	9	14	13	73
Flockhart, I. H.	Merredin ...	...	Totadgin	27	9	9	14	13	72
ZONE No. 7.—Judge: A. S. Wilde, Senior Agricultural Adviser.									
Coad, H. J.	Lake Grace	Lake Grace	Bencubbin	37	8	8	14	14	81
Freebairn, F. S.	Jilakin ...	Kulin ...	Gluclub ...	36	9	9	12	13	79
Carruthers, H. F.	Lake Grace	Lake Grace	Waratah	31	9	9	13	14	76
Scadding, N. A.	Jilakin ...	Kulin ...	Bencubbin	33	9	9	12	13	76
Williams, T. C.	S. Kukerin	Kukerin	Bencubbin	32	8	9	14	13	76
Adams, E. ...	S. Kukerin	Kukerin	Yandilla King	33	7	8	13	13	74
Grant, L. J.	Karlgarin ...	Karlgarin	Totadgin	31	8	8	14	13	74
Parsons, F....	Kondinin ...	Karlgarin	Bencubbin	30	8	9	12	14	73
Murray, A....	Tinkurrin ...	Harrismith	Totadgin	28	8	8	14	13	71
Ballard, B....	Tinkurrin ...	Harrismith	Bencubbin	28	7	9	13	13	70

Royal Agricultural Society Zone Championship Awards—continued.

Competitor.	Address.	Society.	Variety.	Yield. 50 pts.	Freedom from Weeds. 10 pts.	Freedom from Disease. 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total. 100 pts.
ZONE No. 8.—Judge: N. Davenport, Senior Agricultural Adviser.									
Cockram, C.	... ...	Gnowangerup	Free Gallipoli	40	9	9	14	13	85
Richards, A.	... ...	Royal ...	Cluclub ...	36	9	9	14	13	81
MacDonald, J.	... ...	Gnowangerup	Bencubbin	35	9	9	14	13	80
Fleay, R. H. & Sons	... ...	Wickepin	Graham	30	7	8	14	12	71
Hosken Bros.	... ...	Wickepin	Free Gallipoli	23	9	9	14	13	68
ZONE No. 9.—Judge: A. S. Wild, Senior Agricultural Adviser.									
Chambers Bros.	Ravensthorpe	... ...	Bencubbin	28	7	8	14	13	70
Barrett, M....	Ravensthorpe	... ...	Bencubbin	27	8	8	13	13	69
Campbell, J.	Mt. Short ...	... ...	Bencubbin	25	8	8	14	12	67
Bebbington Bros.	Mt. Short...	... ...	Bencubbin	21	9	7	14	12	63

OBJECTS OF THE COMPETITION.

This competition was instituted with the object of improving the methods of general farming practised throughout the wheat belt. A spirit of healthy rivalry is engendered and competitors and others set themselves to follow those more successful than themselves. It is demonstrated that where recommended methods are employed reasonable success follows.

THE SEASON.

With the exception of several thunderstorms, no rain of consequence fell until March when a general disturbance of a monsoonal nature resulted in what is probably the wettest March in the State's history As well as relieving a period of water shortage these rains resulted in considerable weed growth on the fallows, and afforded an excellent opportunity for the cultivation of the fallows. Further general rains early in April were followed by bright weather until early in May, when the true winter rains commenced. Fairly good falls occurred in the southern and south-western portions of the wheat belt, but registrations were light in the remaining districts. Dry conditions and relatively high temperatures prevailed until nearly the end of the month, when a further disturbance brought satisfactory falls to most wheat belt centres, with the exception of the north-eastern districts.

Further rains in June over the whole of the wheat belt materially improved the outlook, which by the end of the month gave promise of being satisfactory. In the more westerly districts weed trouble was very pronounced.

Throughout July and August satisfactory growing conditions continued throughout most of the wheat country, though at the end of that period many crops were still comparatively backward, due to the delayed germination.

On the other hand, early sown crops appeared very promising. At the same time it was obvious that early attempts to control weed growth had not been fully effective. This was particularly the case on the lighter type of soil, where cape weed had been very troublesome.

During September the rainfall was light, especially in the north-eastern section of the wheat belt. This condition also existed throughout October, and these scanty spring rains resulted in a rapid ripening of the crops, with a ten-

dency to the production of pinched grain. A bad attack of rust in the west portions of the wheat belt, increasing in severity towards the north, caused considerable damage, and in some cases complete loss.

ENTRIES.

Entries were received from 17 district Agricultural Societies, and seven entries were made direct to the Royal Agricultural Society.

In addition to these main competitions, local competitions were held by the Kirwan and Wialki-Bonnie Rock Settlers' Associations, and by the Bruce Rock and Southern Cross Agricultural Societies, the total number of entries for these being 26. In all, there were 140 crops inspected.

The following table shows the progress of the competition since its inception in 1921:—

Year.	Number of District Agricultural Societies competing.	Number of Competitors.	Average Yield of Competitors. bush.	Average Yield for State. bush.
1921	...	15	25	10·4
1922	...	32	24	8·9
1923	12	82	29	11·4
1924	15	70	31	12·8
1925	13	59	22·5	9·7
1926	11	99	24·5	12·0
1927	10	100	26·9	12·1
1928	13	114	22·5	10·1
1929	12	156	21·7	11·0
1930	15	165	27·4	13·3
1931	13	110	27·4	13·1
1932	17	168	29·3	12·3
1933	17	130	27·2	11·7
1934	17	114	26·8	9*

* Estimate. District Agricultural Societies did not compete until 1923.

YIELDS.

To the competitor who obtains the highest calculated yield per acre from the competing area the Royal Agricultural Society has, since 1925, awarded a special prize of £5 5s.

The prize this year was won by Mr. C. E. Cockram, of Pallinup, with a yield of 40 bushels per acre with the variety "Free Gallipoli."

The winners of the prize to date are:—

	Bus./Acre.
1925—Hebiton & Sons, Three Springs, "Nabawa" ..	34
1926—Cuming Bros., Carnamah, "Yandilla King" ..	38
1927—A. W. Parkinson, Gnowangerup, "Yandilla King"	40
1928—A. W. Parkinson, Gnowangerup, "Yandilla King"	40
1929—C. E. Cockram, Pallinup, "Yandilla King" ..	46
1930—C. Smith & Sons, Yarding, "Gluclub"	43
1931—H. O. Beeck, Gnowangerup, "Yandilla King" ..	42
1932—F. S. Freebairn, Jilakin, "Gluclub"	47
1933—D. Davis, Gnowangerup, "Bencubbin"	43
1934—C. E. Cockram, Pallinup, "Free Gallipoli" ..	40

Those competitors obtaining 35 bushels or over are as tabulated below:—

Zone.	Competitor.	Address.	Society.	Variety.	Yield. bush.
8	Cockram, C. E. ...	Pallinup ...	... Gnowangerup ...	Free Gallipoli	40
1	Bothe, B. D. ...	Coorow ...	... Carnamah	Bencubbin	37
7	Coad, H. J. ...	Lake Grace	... Lake Grace ...	Bencubbin	37
7	Freebairn, F. S. ...	Jilakin ...	... Kulin	Gluclub	36
8	Richards, A. ...	South Caroling	... Royal	Gluclub	36
8	Griffiths, H. ...	Gnowangerup	... Gnowangerup ...	Bencubbin ...	35
7	Hodgson, H. J. ...	Jilakin ...	... Kulin	Gluclub	35
8	MacDonald, J. ...	Gnowangerup	... Gnowangerup ...	Bencubbin	35
5	Smith, C. & Sons ...	Yarding ...	... Bruce Rock ...	Gluclub	35

LOCAL CROP COMPETITIONS, 1934.

I. Thomas, Superintendent of Wheat Farms.

In addition to the main 50-Acre Crop Competition conducted by the Royal Agricultural Society, similar competitions of a local nature are held by unaffiliated bodies or by agricultural societies.

The District Agricultural Society of Bruce Rock conducted a 50-Acre Fallow and Crop Competition, and the Southern Cross Agricultural Society and the Kirwan and Wialki-Bonnie Rock Settlers' Associations held 50-Acre Crop Competitions; the latter for the Bevan trophy.

The competitors for the above competitions totalled 26, and the average yield was 19.7 bushels.

The following are the particulars of the respective competitions:—

BRUCE ROCK AGRICULTURAL SOCIETY.

Judge: F. L. Shier, Senior Agricultural Adviser.

The rainfall as recorded at Bruce Rock was as follows:—

					Growing Period.									Total. for Year.
Place.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	
Bruce Rock ...	34	25	207	326	74	184	169	110	57	66	660	109	27	1,388

The above society commenced a fallow and crop competition in 1933 for which there were eight entries, the report on which appeared on page 239 of the June, 1934, issue of this Journal.

In continuation of this competition competing crops were planted on six of the fallows so entered.

The combined awards made by the judges for both sections, together with the cultural details, are as follow:—

Competitor.	District.	Variety.	Yield 50 pts.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 pts.	Fallow, 100 pts.	Total, 200 pts.
Pimlott, S. H. ...	Kwolyin ...	Bencubbin	24	8	9	14	13	68	92	160
Currie, J. J. ...	Bruce Rock	do.	22	8	9	14	14	67	88	155
Smith, C. & A. H.	do. ...	do.	22	9	9	14	13	67	86	153
Buller & Black ...	Babakin	Gluclub ... / Bencubbin	24	8	8	13	12	65	85	150
Cole, R. T. ...	Bruce Rock	Gluclub ...	22	7	9	12	11	61	87	148
Fuchsbichler, M. ...	do.	do. ...	18	7	9	13	13	60	87	147
Stevens, D. ...	do.	Withdrew	...	...	...	...	...	...	87	...
Schilling, C. E. & M. T.	do.	do. ...	...	...	...	...	...	...	86	...

CULTURAL DETAILS.

Competitor.	Years Cropped	Original Timber	When Ploughed.	Condition of Land.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Pimlott, S. H.	Old land	Salmon gum and gimlet	Mid-June ...	Good	Rigid tyne scarifier	3	Springtyne cultivated July; again August; again March after heavy rains. Planted with combined cultivator drill	Mid-May ...	60	112	Yes	Dry	
Currie, J. J. ...	Old land	Salmon gum and gimlet	Late June	A little dry	Mouldboard	3	Springtyne cultivated late August; again September; again October, and early December after rain; harrowed after March rains; springtyne cultivated May. Planted with combined cultivator drill	Mid-May ...	60	90–100	Yes	Dry	
Smith, C. & A.	Old land	Salmon gum and gimlet	Mid-June ...	Fair	Mouldboard	2½	Rigidtyne cultivated twice in Spring and again April. Planted with combined cultivator drill	May	45	112	Yes	Dry	
Buller & Black	Old land	Salmon gum, gimlet and mallee	Late July	Hard	Disc ...	3	Rigidtyne cultivated September, April and May. Planted with combined cultivator drill	End May ...	50	90	Yes	Dry ...	Trace of bail smut and takeall.
Cole, R. T. ...	Old land	Salmon gum and gimlet	Early July	Wet	Disc ...	3½	Rigidtyne cultivated August; springtyne cultivated September, and again October, and again November. Planted with combined cultivator drill	Lask week April	50	90	Yes	Dry ...	Trace of takeall.
Fuchsbichler, M.	Old land	Gimlet and salmon gum	Mid-July ...	A little hard	Rigid tyne scarifier	3	Rigidtyne cultivated Mid-August; springtyne cultivated September, and again October; rigid tyne cultivated after March rains, and planted with combined cultivator drill	Mid-May ...	45	112	Yes	Dry	

SOUTHERN CROSS AGRICULTURAL SOCIETY.

Judge: R. P. Roberts, Agricultural Adviser.

The rainfalls recorded at the stations concerned are as follow:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total. for Year.
Southern Cross	66	*Nil*	113	504	1	142	139	219	90	39	630	31	13	1,357
Bullfinch ...	14	*Nil*	115	457	2	145	152	250	69	29	647	29	20	1,282
S. Moorine Rock	25	2	77	526	5	143	162	190	70	47	617	29	44	1,320

The awards made and the cultural details are as tabulated below:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth, 15 pts.	Total, 100 points.
Smith, P. J.	Turkey Hill ...	Bencubbin ...	24	7	9	13	11	64
White, G.	Bullfinch ...	Bencubbin ...	20	8	9	14	12	63
Dowdall, A. E. ...	South Moorine Rock	Gluyas Early	14	7	8	13	13	55

CULTURAL DETAILS.

Competitor.	Years Cropped	Original Timber	Condition of Land.	When Ploughed.	Implements.	Depth.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Graded.	Seed Treatment.	Disease.
						in.			lbs.	lbs.			
Smith, P. J. ...	3	Salmon gum, gimlet, jam, and mallee	Good	June and July	Disc cultivating plough	3	Springtyne cultivated in August and September. Planted with a combined cultivator drill	21st April to 3rd May	24	67	Yes	Dry pickled	A little root rot.
White, Geo. ...	3	Salmon gum, gimlet, mallee and jam	Good	July ...	Disc cultivating plough	3	Springtyne cultivated in August. Planted with a combined cultivator drill	End of April ...	30	60	No	Dry pickled	Traces of root rot.
Dowdall, A. E.	4	Morrel and boree	Good	July ...	Springtyne cultivator	3	Springtyne cultivated in September; harrowed in November and again after rain during January. Planted with a combined cultivator drill	Last week in May	27	80	Yes	Dry pickled	A little bunt and some flag smut.

WIALKI-BONNIE ROCK SETTLERS' ASSOCIATION.

Judge: N. Davenport, Senior Agricultural Adviser.

The rainfalls as recorded at the several stations concerned are as follow:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total. for Year.
Wialki (Barwise)	94	45	173	248	11	116	164	191	81	3	566	19	*Nil*	1,145
N. Dalgouring	78	54	143	256	11	186	159	270	75	25	726	33	*Nil*	1,290*
Karloning ...	*Nil*	29	154	281	7	119	191	216	66	6	605	37	7	1,113
Bonnie Rock ...	40	27	157	334	14	153	141	239	58	8	613	83	*Nil*	1,254
Jouerdine (Richardson Bros.)	35	26	148	285	10	136	147	201	90	9	593	26	*Nil*	1,113

* Excluding December.

The awards made and the cultural details are shown hereunder:—

Competitor.	Address.	Variety.	Yield 50 points.	Freedom from Weeds. 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture. 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Freedman, L. F. ...	Bonnie Rock ...	Bencubbin	24	9	9	14	13	69
Stiepwich, W. N. ...	Karloning ...	Gluyas Early	23	9	8	13	14	67
Hammond, T. A. ...	Dalgouring ...	Noongaar ...	20	9	9	14	13	65
Borlase, J.	Karloning ...	Bencubbin ...	18	9	9	14	14	64
Wright, V. H. ...	North Dalgouring	Noongaar ...	20	8	9	14	12	63
Chamberlain & Pratt...	North Dalgouring	Totadgin ...	18	7	9	14	11	59
Sprigg, W. L. ...	Bonnie Rock ...	Canberra ...	16	9	8	14	12	59
Richardson Bros. ...	do. ...	Bencubbin ...	17	8	9	13	11	58
Hurt, W.	Wialki ...	Gluyas Early	17	7	9	13	11	57
Irvine, L.	do. ...	Totadgin ...	15	6	9	13	12	55
Vincent, K.	do. ...	do. ...	14	6	9	14	11	54

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs.			
Freedman, L. F.	First	Salmon gum, jam, and tea-tree scrub	Original working; springtyne cultivated, July	Springtyne cultivator	3	Good	Planted with combined cultivator drill	1st week May	38	80	Copper carbonate	Yes	
Stiepwich, W. N.	4	Gimlet, salmon gum and mallee	Late July	Disc ...	3½	Good	Springtyne cultivated late August, again early September, again October; harrowed in December after rain; springtyne cultivated prior to seeding with a combined cultivator drill; sheep on fallow	2nd week May...	33	83	Copper carbonate	Yes	A trace of flag smut
Hammond, T.A.	3	Gimlet ...	End July	Disc ...	3–4	Good	Reploughed mid-May; planted with combined cultivator drill	2nd week June	43	93	Copper carbnoate	Yes	
Borlase, J. ...	3	Jam, gimlet and mallee	Early June	Disc ...	3½	Good	Springtyne cultivated September and after rain in summer; planted with combined cultivator drill	1st week May	29	70	Copper carbonate	Yes	
Wright, V. H....	4	Gimlet and mallee	July ...	Disc ...	2½–3	Good	Springtyne cultivated September; disc ploughed in May, and planted with disc drill	1st week June	35	60	Copper carbonate	Yes	
Chamberlain & Pratt	3	Salmon gum and gimlet	July ...	Disc ...	2½–3	Good	Harrowed in August and September; planted with combined cultivator drill	Mid-May ...	36	80	Copper carbonate	Yes	
Sprigg, W. L....	3	Tea-tree, mallee and jam	June ...	Mouldboard	4	Good	Springtyne cultivated September, again in April; planted with combined cultivator drill	3rd week May	28	60	Copper carbonate	Recleaned	Flag smut.

CULTURAL DETAILS—*continued.*

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
Richardson Bros.	3	Salmon gum, gimlet and mallee	End July	Disc ...	in. 3	Good	Springtyne cultivated October; after rain in March; planted with combined cultivator drill	1st May ...	lbs. 36	lbs. 90	Copper carbonate	Yes	
Hurt, W. ...	3	Jam, tea-tree, mallee	June ...	Disc ...	4	Good	Turned back with disc cultivator in September; planted with combined cultivator drill	Mid-May ...	37	82	Copper carbonate	Yes	Trace of flag smut.
Irvine, L. ...	4	Jam, mallee, tea-tree	End July	Disc ...	3	Good	Springtyne cultivated in September; planted with combined cultivator drill	2nd week May	38	90	Copper carbonate	Yes	
Vincent, K. ...	4	Salmon gum, gimlet	July and August	Disc ...	3	Fair	Springtyne cultivated in October; planted with combined cultivator drill	...	...	...	...	...	

KIRWAN AGRICULTURAL BUREAU.

Judge: N. Davenport, Senior Agricultural Adviser.

The rainfalls recorded at Kirwan are as follow:—

Place.	Jan.	Feb.	Mar.	Apl.	Growing Period. May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	Total for Year.
Kirwan (Mitchell)	124	61	65	256	41	172	227	174	52	11	677	101	*Nil*	1,284*
Grieves (official)	106	70	62	321	26	196	224	185	55	24	710	85	10	1,364

* Excluding December.

The awards made and the cultural details are given below:—

Competitor.	Address.	Variety.	Yield, 50 points.	Freedom from Weeds, 10 pts.	Freedom from Disease, 10 pts.	Freedom from Admixture, 15 pts.	Evenness of Growth. 15 pts.	Total, 100 points.
Mitchell, J. A. & H. S.	Kokardine ...	Bencubbin ...	24	9	7	14	13	67
Joynes, W. T. ...	do. ...	Nabawa ...	22	8	9	14	12	66
Montague, J. G. ...	Kirwan ...	Bencubbin ...	21	8	8	14	13	64
Clover, G.	Koorda ...	Nabawa ...	16	9	9	14	13	61
Strahan Bros.	Kulja	Bencubbin ...	18	7	9	14	12	60
Broadhurst Bros. ...	Burakin ...	Gluclub ...	19	7	9	12	12	59

CULTURAL DETAILS.

Competitor.	Years Cropped.	Original Timber	When Ploughed.	Implements.	Depth.	Condition of Land.	Subsequent Cultivations.	When Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Disease.
					in.				lbs.	lbs.			
Mitchell, J. A. & H. S.	4	Tea-tree and little white gum	...	...	...	...	Initial working alone by springtyne cultivator in July; cross-cultivated in August and September; harrowed after rain in November and March; planted with combined cultivator drill	2nd and 3rd week May	50	90	Copper carbonate	Yes	Rust; trace of flag smut and takeall.
Joynes, W. T....	3	Salmon gum and gimlet	Two year fallow	Disc ...	3	Good	Disc cultivated March after rain; planted with disc drill	Mid-April ...	45	112	Copper carbonate	Yes	Trace loose smut.
Montague, J. S.	Old land	York gum, tea-tree and jam	July ...	Disc ...	3½	Good	Partly ploughed back in September; planted with combined cultivator drill	1st week May	52	100	Copper carbonate	Yes	Trace of flag smut.
Clover, G. ...	First	Broom bush scrub and little mallee	Early August	Disc ...	3	Good	Ploughed back in April and planted with a disc drill	End of May ...	40–45	95	Copper carbonate	Yes	
Strahan Bros.	5	Broom bush and tamma	August ...	Disc ...	3	Good	Harrowed in September and planted with combined cultivator drill	Early May ...	45	93	Copper carbonate	Yes	
Broadhurst Bros.	4	Tea-tree and mallee	August ...	Disc ...	3	Good	Harrowed prior to drilling	4th week April	40	110	Copper carbonate	Yes	

POULTRY FARMING FOR THE BEGINNER.

G. D. Shaw,
Poultry Adviser, Department of Agriculture.

PART 3.

It is in March and April that we should begin to consider our means of increase for next year's stock.

The pullets hatched last September are now in full lay, and can be expected to continue production for about a year, a few longer if allowed.

The continued practice of culling daily will eliminate the unprofitable layer.

Trapnesting will be the positive means but continued handling will enable one to ascertain if the bird handled is a good "doer," *i.e.*, one which is showing steady progress in condition. It will generally be noticed that the best birds are early off the perch and last to go to roost, always working for the little scraps of food and titbits which may be found.

The dry feed hopper mentioned before is now most important. The heavy layer cannot produce her full quantity of eggs unless she can obtain the egg-forming food in greater quantities than the average producer. Keep the hopper well supplied.

Watch out for those ailments, colds and catarrh, which may easily spread at an alarming rate if not immediately arrested.

Breeding.

It is from those pullets completing the first year's lay that we select our breeding pens. Select those birds which have good egg production and good bodies; those that have gained weight while in heavy production.

A bird which is from good average high producers and that can gain weight while laying will produce eggs which will hatch good healthy chicks. Too much stress is laid on high production and too little attention given to the vitality of the future breeder. A 300 "egger," unless she can produce good healthy chicks, is of no use as a breeder. The popular fancy for breeding is a cockerel from a hen which laid around 280 eggs—mated to hens around about 250 egg production. If such parents were from strong stock, the progeny has then a good chance of continuing in that strength and vitality.

Be careful of the high producer. Most of our troubles are being caused by using as breeders birds whose only attribute is eggs.

The stock must be true to type. It is of little value if one gains eggs without type. Type is the sole guarantee that eggs can be produced and unless one pursues the course of type first, sooner or later there is a breakdown.

Having selected the birds which conform to the type of your particular breed throw them into a moult at the end of March. This period is generally at the end of a twelve months laying test and it gives the birds three months to manufacture new feathers and recoup for the strenuous year ahead. That forced rest is an insurance for good easily reared chicks. A bird should not be expected to lay herself out and then go into a breeding pen and be expected to produce strong chicks.

Besides the breeder it will eventually be found a good practice to force all birds into a moult in April. It is sound practice. It allows the future second year layers to have a rest and they can then be considered as birds which will lay from June through 9 or 10 months before breaking down.

Previously, it was mentioned that you must "put into the bird what you want, not what they want." To cause a moult don't starve the birds. Starving produces the opposite result to that desired. The growth of new feathers, the recouping of condition need feed and plenty of it, but egg production must be stopped. Therefore, take from the mash the egg-producing ingredients. A successful practice is to feed only on a wet mash consisting mostly of bran with neither bonemeal nor meatmeal, a little wheatmeal *or* pollard to dry off and the dry mash of *flaked* bran only with wheat at night. It certainly causes a stoppage of egg production. After four or five days gradually incorporate in the bran mash all the ingredients again, but be sparing on the meatmeal and bonemeal for about six weeks, when the full growers' ration can then be fed.

The hopper during this period contains dry flaked bran only. When the feathers are again full grown and the comb has gained its fullness, change all mashes to the growers' ration and egg production will quickly come into being. The selected breeders are in the best condition and you will obtain good, hardy, easily reared chicks.

For those who have only pullets to place in the breeding pens, the purchase of a pen or pens of birds treated as above for the foundation of the next year's layers is advised. Birds are not sold cheaply when they are good, so expect to pay up to £3 3s. for a good cockerel from trapnested stock and 10s. 6d. to 30s. for hens treated likewise. *Do no purchase cockerels at cheap rates nor hens which are only valued by their owner at* 5s. My prejudice against pullets as breeders is founded on the trapnest records.

No matter how well a pullet may develop before July, that development is no guarantee that it will still be progressive. By the time it has had another nine months' laying and three months' moulting, many things can develop which denote constitutional weakness. It would be nothing short of a tragedy to find that a pen of high producers after giving your year's supply of chicks, developed such defects as ridged eggs, mis-shapen eggs, dropped behind, pendulous crops, crocked breastbones and a host of other constitutional complaints, but, if at the end of their 18 months of life, they are free from defects one has a fair chance of placing in the breeding pen birds constitutionally strong. If you cannot afford to purchase the 12 month old breeders, together with appliances such as incubators, again purchase day old chicks, but I strongly advise a pen or two on which to learn your occupation of incubating.

Breeding Pens.

During the moulting period, allow all birds which are moulting to have as much free range as possible. If space is restricted, give all you can to the future selected breeders. When ready for mating, bring them into sheds which are prepared for their reception. As they will not stay in those sheds longer than three to four months, a less pretentious building is required for layers. A double shed with a small yard for each half is a good practice and can be rested at the end of the breeding season, or can be used for surplus male birds.

A suitable shed and/or battery of breeding sheds is as shown on next page.

Nest boxes are placed in the side of the shed, and are accessible from the inside. The nests themselves are made out of kerosene tins cut in two, on the flat, with edges hammered back, placed alongside one another, or may be a full tin cut as for trap-nests. Each end of the nest rests on 2in. x 1in. boards running the whole length of the nest boxes, and supported by wooden brackets or cross-supports and legs, and housed in.

With care in the method of selection for our breeders, we should not have much trouble during the next breeding season.

Egg Eating Habit.

This can develop in a flock of birds to a degree which is apalling. The birds acquire the habit through gaining access to a broken egg in the nest or on the floor. Once a bird learns what an egg contains it develops the practice of breaking the egg. Other birds are taught—the losses grow. When using trapnests, the culprit is found at once, but under the system of open nests, one must watch closely until the wrongdoer is isolated. Kill or market that bird.

Apart from the bad habit, the lack of lime-forming material may be a cause. Plenty of shell grit in the nest boxes will assure a supply and at the same time keep the eggs clean. Several suggestions are offered in order to break the habit, but the habit should not be allowed to form. Collect eggs frequently—see that there is plenty of nesting material and plenty of egg-forming material.

Feather Eating.

Another bad habit is feather pulling. It is generally induced through a lack of something in the ration or, again, by idleness. Lice infected birds may acquire the habit. With lice the birds may cause blood to flow and the other birds then resort to cannibalism. This habit seldom occurs in flocks well fed and housed.

Scaly Leg.

As its name indicates, scaly leg is a disease of the shanks and feet of poultry. The cause is a very small mite, which spreads rapidly from one fowl to another. The scales usually occur first on the feet and then shanks. After development, they form crusts, which are unsightly and painful. The toes may eventually fall off.

Cleanliness and sanitation are preventatives. Rub the affected parts with an oil of an animal or vegetable nature or with vaseline. Application when first noticed will quickly rid the bird of the trouble. Should it be allowed to develop, long treatment is necessary. A developed condition of scaly leg denotes mismanagement.

Kerosene applications are very stringent and not advised, but if used, care should be taken to see that the kerosene does not touch the skin above the shank.

Bumble Foot.

Generally caused through an injury to the foot by flying from high roosts—damage by stones and hard ground.

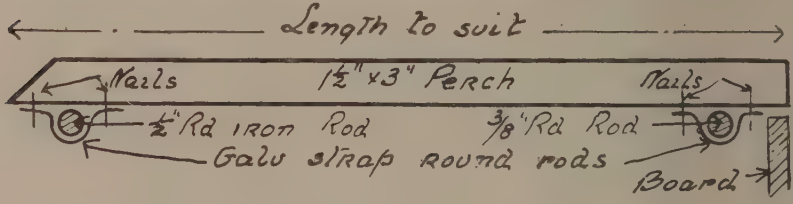
Symptoms are a corn on the sole of the foot which later swells to an abscess. The corn can often be removed easily but should an abscess form, it must be allowed to form a "head," after which cut, press out the core, apply carbolised vaseline to wound, then bandage. Keep plenty of litter on the floor of the shed containing the injured bird.

Crop Bound.

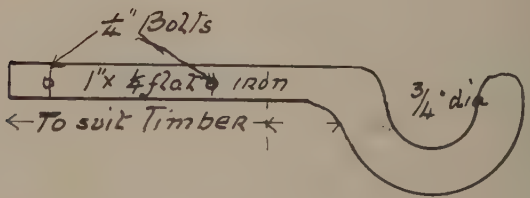
Long fibrous grass will cause crop bound. The birds are listless, having a hard heavy crop. The fibres have most likely balled and clogged the outlet (oesphagus). It may also be caused through eating too much food after having starved for a period. A crop bound bird should be treated as soon as possible. There are two treatments. One is to pour luke warm water down the bird's throat and then knead the crop. Suspend the fowl head downwards and try to force the contents out. Be careful not to choke the bird. The surest remedy is to pluck the feathers from the top of the crop, make a small incision, and remove the contents of the crop, clean out with warm water, then pour into the crop a little

olive oil. Using a needle and cotton, draw the incision together. Keep the bird quiet for 24 hours. The first feed should be soft, after which it can be placed on ordinary diet.

Remove the cause and so save a repetition of the trouble. It is very prevalent when a farmer uses chaff as a substitute for green feed.



— Arrangement of Perch & Rods —



— 1"x¼" hook for Perches

Perches are held on two rods, the rear one ½in. diameter and the front one ⅜in. diameter. The rear rod rests in a hook and the front of the perch rests on the dividing board. The perches are held to the rods by galvanised clips. The *hooks* in which the rear rods rest are made either of 1in. x ¼in. flat iron bolted to the studs, or ⅜in. round iron driven into the studs.

To clean beneath the perches, it is only necessary to lift the front rod up and rest the perches against the wall, the rear rod acting as a hinge in the hook.

Worms.

Symptoms—Wasting away, loss of appetite, ruffled plumage, mustard-coloured droppings, sometimes tinged with blood. Always be on the lookout for worms. These are of many species and should be treated with the proprietary mediums or by the use of Black Leaf 40, as follows:—

Use ½ oz. Black Leaf 40 (one tablespoonful) to each 250 grown fowls. Mix this with 1½ gallons of water, then dissolve 3 lbs. sugar in the water. When the sugar is thoroughly dissolved, use this 1½ gallons of mixture to mix 20 lbs. of growing or laying mash; more fresh water may be added if necessary. A feed should be missed out before giving the mash containing Black Leaf 40. This mash is fed in the morning and no more feed given until the evening. ¾lb. Epsom salts is put in each 2½ gallons drinking water and left there until it is all consumed. Young stock averaging 2 lb. live weight should only have the ½ oz. Black Leaf 40 mixture to each 375. As Black Leaf 40 is poisonous, the above quantity should be strictly adhered to. Some poultry farmers are following the above treatment with 1 per cent. tobacco dust in the mash weekly for three or four weeks.

Remove and burn all droppings after giving medicines for worm troubles.

AGRICULTURAL PROBLEMS

Agriculturists, pastoralists and primary producers generally, who may be having difficulties of any kind in connection with their production activities, are invited to communicate with the Agricultural Adviser of their district of the Department of Agriculture, when information and advice will be supplied free of charge.

Where identification of plant or stock diseases or insect pests is required, full details of symptoms should be forwarded and also samples of the diseased plant, animal tissue or insect where practicable. Plant tissue intended for examination by the Plant Pathologist should be wrapped in paper and not forwarded in airtight containers, and plant specimens for the Botanist should be pressed between newspaper and dried before despatch. With regard to animal tissue for microscopic examination, this should be forwarded in a solution of 10 per cent. formalin, or if of considerable bulk in a sealed kerosene tin containing a few ounces of formalin as a preservative. Living insects should be sent in suitable containers and dead specimens in methylated spirits.

The addresses and names of Advisers are as follows:—Albany, A. C. Vaughan; Bridgetown, A. Flintoff; Bunbury, M. Cullity; Denmark, V. Cardon; Geraldton, G. L. Throssell, Government Buildings; Gosnells, R. C. Owen; Harvey, D. L. Breen (Fruit) and C. Giles (Dairying); Katanning, A. S. Wild; Manjimup, J. Ireland; Mundaring, V. Cahill; Northam, F. L. Shier; Northcliffe, A. Sharp; Vasse, J. M. Nelson.

FERTILISERS.

N. Davenport,
Inspector of Fertilisers.

A new fertiliser year for the State commenced on 1st November last, and in accordance with the provisions of the Fertilisers Act, 1928, the current registrations are appended in tabular form.

From the retail prices per ton, and the registered percentages of the various fertilising ingredients present in the fertilisers, the unit values for the different forms of nitrogen, phosphoric acid, and potash have been calculated and are shown below, together with those of 1933 and 1934 for comparison.

UNIT VALUES.

	1933.	1934.	1935.
	s. d.	s. d.	s. d.
Nitrogen (N) as—			
Blood and Bone, Bonedust and Bone and Flesh	24 0	23 0	22 0
Nitrate	19 10	19 11	19 7
Ammonia	11 0	12 4	12 3
Phosphoric Acid (P_2O_5) as—			
Water Soluble	4 2	3 11	3 9
Citrate Soluble	4 2	3 11	3 9
Acid Soluble in Bonedust	6 6	5 9	
Acid Soluble in Blood and Bone and other animal fertilisers	5 6	5 3	5 3
Basic Phosphate	5 6	5 6	5 4
Superphosphate and Rock Phosphate	2 6	2 6	2 4
Potash (K_2O) as—			
Sulphate	8 5	8 5	6 4
Muriate	6 7	6 7	5 0

The following fertilisers have been registered at the Department of Agriculture under the Fertilisers Act, 1928, for the year commencing 1st November, 1934.

Name of Fertiliser.	Brand.	By whom Registered.	Nitrogen (N) as:				Phosphoric Acid (P_2O_5) as:				Potash (K_2O) as:		Price per ton on rails at Works or Perth.
			Nitrate.	Ammonia.	Blood & Bone.	Bone-dust.	Water Soluble.	Citrate Soluble.	Acid Soluble.	Total.	Sulphate.	Muriate.	
A.—MINERAL.			%	%	%	%	%	%	%	%	%	%	£ s. d.
1.—NITROGENOUS.													
(a) Nitrogen as Nitrate.													
Nitrate of Soda	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	15·50	...	...	...	...	...	...	...	...	...	15 4 0
Do.	ML in diamond ...	do. do.	15·50	...	...	...	...	...	...	...	...	...	15 4 0
Do.	C.S.M.L.	do. do.	15·50	...	...	...	...	...	...	...	...	...	15 4 0
Do.	Cresco	Cresco Fertilisers (W.A.), Ltd	15·00	...	...	...	...	...	...	...	...	...	15 5 0
(b) Nitrate as Ammonia.													
Sulphate of Ammonia ...	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	..	20·50	...	...	...	...	...	...	...	...	12 10 0
Do.	ML in diamond ...	do. do.	...	20·50	...	...	...	...	...	...	...	...	12 10 0
Do.	C.S.M.L.	do. do.	...	20·50	...	...	...	...	...	...	...	...	12 10 0
Do.	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	20·00	...	...	...	...	...	...	...	...	12 7 0
Do.	ICI in circle ...	F. Viles	...	20·60	...	...	...	...	...	...	...	...	12 12 0
Do.	Venus	Nedlands Lawn & Garden Co.	...	20·60	...	...	...	...	...	...	...	...	12 10 0
2.—PHOSPHATIC.													
(a) Rock Phosphates.													
Pacific Islands Phosphate ...	Sickle	Cuming Smith, Mt. Lyell F.F., Ltd.	...	...	...	...	...	...	36·65	36·65	...	...	4 7 6
Do. do. ...	ML in diamond ...	do. do.	...	...	...	...	...	...	36·65	36·65	...	...	4 7 6
Do. do. ...	C.S.M.L.	do. do.	...	...	...	...	...	...	36·65	36·65	...	...	4 7 6
Phosphate Powder	Cresco	Cresco Fertilisers (W.A.), Ltd.	..	...	...	...	...	...	34·80	34·80	...	...	3 15 0
(b) Superphosphates.													
Florida Super 22%	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	20·50	·50	1·00	22·00	...	...	4 0 0
High Grade Super 22% ...	ML in diamond ...	do. do.	...	...	...	...	20·50	·50	1·00	22·00	...	...	4 0 0
Do. do. ...	C.S.M.L.	do. do.	...	...	...	...	20·50	·50	1·00	22·00	...	...	4 0 0

22 Super	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	20·50	·50	1·00	22·00	...	...	4 0 0
Florida Super 24	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	22·00	·50	1·50	24·00	...	...	4 5 0
High Grade Super 24 ...	ML in diamond ...	do. do.	...	...	...	...	22·00	·50	1·50	24·00	...	...	4 5 0
Do do. ...	C.S.M.L.	do. do.	...	...	...	...	22·00	·50	1·50	24·00	...	...	4 5 0
24 Super	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	22·00	·50	1·50	24·00	...	...	4 5 0
(c) Rock Phosphates and Superphosphates.													
Phosphate Mixture 50/50 ...	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	10·00	1·00	18·00	29·00	...	...	4 7 6
Do. do. ...	ML in diamond ...	do. do.	...	...	...	...	10·00	1·00	18·00	29·00	...	...	4 7 6
Do. do. ...	C.S.M.L.	do. do.	...	...	...	...	10·00	1·00	18·00	29·00	...	...	4 7 6
50/50 Phosphate	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	9·16	1·84	17·40	28·40	...	...	4 5 0
(d) Basic Phosphate.													
Basic Phosphate	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	...	...	17·00	17·00	...	...	4 10 0
Do.	ML in diamond ...	do. do.	...	...	...	...	...	...	17·00	17·00	...	...	4 10 0
Do.	C.S.M.L.	do. do.	...	...	...	...	...	...	17·00	17·00	...	...	4 10 0
3.—POTASSIC.													
(a) Potash as Sulphate.													
Sulphate of Potash	Sickle	Cuming Smith Mt. Lyell FF., Ltd.	...	...	...	...	...	...	...	...	48·60	...	15 5 0
Do.	ML in diamond ...	do. do.	...	...	...	...	...	...	...	...	48·60	...	15 5 0
Do.	C.S.M.L.	do. do.	...	...	...	...	...	...	...	...	48·60	...	15 5 0
Do.	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	...	...	...	...	48·50	...	15 5 0
Do.	Sun	Westralian Farmers, Ltd.	...	...	...	...	...	...	...	...	48·60	...	15 5 0
(b) Potash as Muriate.													
Muriate of Potash	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	...	...	...	...	...	50·00	12 10 0
Do.	ML in diamond ...	do. do.	...	...	...	...	...	...	...	...	...	50·00	12 10 0
Do.	C.S.M.L.	do. do.	...	...	...	...	...	...	...	...	...	50·00	12 10 0
Do.	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	...	...	...	...	...	50·00	12 10 0
Do.	Sun	Westralian Farmers	...	...	...	...	...	...	...	...	...	50·00	12 10 0
Kamit	do.	do. do.	...	...	...	...	...	...	...	...	...	14·00	*
Potash Manure Salts ...	do.	do. do.	...	...	...	...	...	...	...	...	...	30·00	*
4.—NITROGEN AND PHOSPHORIC ACID.													
Potato Manure C	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	3·50	...	...	16·75	·40	1·10	18·25	...	...	6 2 6
Do. F	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0

* Prices not available.

FERTILISERS—*continued.*

Name of Fertiliser.	Brand.	By whom Registered.	Nitrogen (N) as:				Phosphoric Acid (P_2O_5) as:				Potash (K_2O) as:		Price per ton on rails at Works or Perth.
			Nitrate.	Ammonia.	Blood & Bone.	Bone-dust.	Water Soluble.	Citrate Soluble.	Acid Soluble.	Total.	Sulphate.	Muriate.	
No. 4—NITROGEN AND PHOSPHORIC ACID—*continued.*			%	%	%	%	%	%	%	%	%	%	£ s. d.
Super and Ammonia, No. 1	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	2·94	...	...	17·57	·43	·85	18·85	...	...	5 17 6
Do. do. No. 2	do.	do. do.	...	5·15	...	...	15·37	·37	·76	16·50	...	...	6 15 0
Do. do. No. 3	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0
Do. do. No. 4	do.	do. do.	...	6·87	...	...	13·66	·34	·66	14·66	...	...	7 10 0
Potato Manure, No. 2 ...	ML in diamond ...	do. do.	...	3·50	...	...	16·75	·40	1·10	18·25	...	...	6 2 6
Do. No. 6 ...	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0
Super and Ammonia, No. 1	do.	do. do.	...	2·94	...	...	17·57	·43	·85	18·85	...	..	5 17 6
Do. do. No. 2	do.	do. do.	...	5·15	...	...	15·37	·37	·76	16·50	...	...	6 15 0
Do. do. No. 3	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0
Do. do. No. 4	do.	do. do.	...	6·87	...	...	13·66	·34	·66	14·66	...	...	7 10 0
Potato Manure C ...	C.S.M.L.	do. do.	...	3·50	...	...	16·75	·40	1·10	18·25	...	...	6 2 6
Do. F ...	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0
Super and Ammonia, No. 1	do.	do. do.	...	2·94	...	..	17·57	·43	·85	18·85	...	...	5 17 6
Do. do. No. 2	do.	do. do.	...	5·15	...	...	15·37	·37	·76	16·50	...	...	6 15 0
Do. do. No. 3	do.	do. do.	...	6·00	...	...	14·25	·40	1·10	15·75	...	...	7 0 0
Do. do. No. 4	do.	do. do.	...	6·87	...	...	13·66	·34	·66	14·66	...	...	7 10 0
Super and Ammonia (3 & 1)	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	5·15	...	...	15·37	·37	·76	16·50	...	...	6 15 0
Potato Fertiliser, No. 2 ...	Crown	Perth Ice and Cool Storage, Ltd.	...	3·20	...	...	10·25	...	1·09	11·34	...	...	7 15 0
Fertos	Floreat	T. S. McGill ...	...	9·38	...	...	15·0	·50	1·55	17·05	...	...	20 0 0
5.—NITROGEN, PHOSPHORIC ACID AND POTASH.													
Potato Fertiliser	Swan	Binney & Son, Ltd.	...	3·20	...	...	10·25	...	2·00	12·25	...	4·00	8 10 0
Do. No. 1 ...	Crown	Perth Ice and Cool Storage, Ltd.	...	3·20	...	...	10·25	...	2·00	12·25	...	4·00	8 10 0
Vine Manure	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	1·50	...	...	7·10	1·40	13·50	22·00	7·50	...	7 7 6
Mixed Manure	do.	do. do.	...	1·50	...	...	7·10	1·40	13·50	22·00	7·50	...	7 7 6
Orchard Manure	do.	do. do.	...	1·50	...	...	7·10	1·40	13·50	22·00	7·50	...	7 7 6
Special Orchard Manure ...	do.	do. do.	...	8·34	...	...	8·40	·20	·40	9·00	...	10·04	10 0 0
Potato Special	do.	do. do.	...	4·00	...	...	12·50	·50	·75	13·75	8·75	...	9 0 0
Potato Manure	do.	do. do.	...	1·50	...	...	7·10	1·40	13·50	22·00	7·50	...	7 7 6
Tobacco Fertiliser	C.S.M.L.	Cuming Smith Mt. Lyell F.F., Ltd.	...	†3·30	...	...	14·00	·50	1·00	15·50	5·70	..	7 16 6
Do.	ML in diamond ...	do. do.	...	†3·30	...	...	14·00	·50	1·00	15·50	5·70	...	7 16 6
Do.	Sickle	do. do.	...	†3·30	...	...	14·00	·50	1·00	15·50	5·70	...	7 16 6
Potato Manure, B	do.	do. do.	...	3·75	...	...	14·50	·35	·75	15·60	4·50	...	7 11 0
Do. E	do.	do. do.	...	3·50	...	...	14·00	·30	·70	15·00	8·00	...	8 10 0
Do. G	do	do. do.	...	3·50	...	...	10·50	·20	·60	11·30	16·00	...	10 7 6
Do. H	do.	do. do.	...	4·00	...	...	12·70	·30	·70	13·70	9·00	...	8 15 0

Do. No. 5 ...	do.	do. do.	...	7·50	...	...	7·00	·20	·40	7·60	13·25	...	11 2 0
Orchard Manure ...	do.	do. do.	...	2·00	...	...	15·75	·40	1·10	17·25	...	5·00	6 14 0
Special Mixture, K ...	do.	do. do.	...	8·34	...	...	8·40	·20	·40	9·00	...	10·04	9 18 0
Do. KP ...	do.	do. do.	...	6·34	...	...	10·50	·20	·80	11·50	10·04	...	9 15 0
Potato Manure, No. 3 ...	ML in diamond ...	do. do.	...	3·75	...	...	14·50	·35	·75	15·60	4·50	...	7 11 0
Do. No. 4 ...	do. ...	do. do.	...	3·50	...	...	14·00	·30	·70	15·00	8·00	...	8 10 0
Do. No. 7 ...	do. ...	do. do.	...	3·50	...	...	10·50	·20	·60	11·30	16·00	...	10 7 6
Do. No. 8 ...	do. ...	do. do.	...	4·00	...	...	12·70	·30	·70	13·70	9·00	...	8 15 0
Do. No. 5 ...	do. ...	do. do.	...	7·50	...	...	7·00	·20	·40	7·60	13·25	...	11 2 0
Orchard Manure ...	do. ...	do. do.	..	2·00	...	...	15·75	·40	1·10	17·25	...	5·00	6 14 0
Special Mixture K ...	do. ...	do. do.	...	8·34	...	...	8·40	·20	·40	9·00	...	10·04	9 18 0
Do. KP ...	do. ...	do. do.	...	6·34	...	...	10·50	·20	·80	11·50	10·04	..	9 15 0
Potato Manure B ...	C.S.M.L.	do. do.	...	3·75	...	...	14·50	·35	·75	15·60	4·50	...	7 11 0
Do. E ...	do.	do. do.	...	3·50	...	...	14·00	·30	·70	15·00	8·00	...	8 10 0
Do. G ...	do.	do. do.	...	3·50	...	...	10·50	·20	·60	11·30	16·00	...	10 7 6
Do. H ...	do.	do. do.	...	4·00	...	...	12·70	·30	·70	13·70	9·00	...	8 15 0
Do. No. 5 ...	do.	do. do.	...	7·50	...	...	7·00	·20	·40	7·60	13·25	...	11 2 0
Orchard Manure ...	do.	do. do.	...	2·00	...	...	15·75	·40	1·10	17·25	...	5·00	6 14 0
Special Mixture K ...	do.	do. do.	...	8·34	...	...	8·40	·20	·40	9·00	..	10·04	9 18 0
Do. KP ...	do.	do. do.	..	6·34	...	...	10·50	·20	·80	11·50	10·04	...	9 15 0
6.—MISCELLANEOUS.													
Sulphate of Iron	Sickle	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	...	...	...	...	...	...	...	11 1 6
Do.	ML in diamond ...	do. do.	...	...	...	...	...	...	...	...	...	...	11 1 6
Do.	C.S.M.L.	do. do.	...	...	...	...	...	...	...	...	...	...	11 1 6
*Super and Manganese ..	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	...	17·00	·50	1·00	18·50	...	...	7 12 6
B.—ORGANIC.													
(*a*) *Blood and Bone.*													
Blood and Bone	Venus	Nedlands Lawn and Garden Co.	...	...	6·00	...	...	...	12·00	12·00	...	...	10 0 0
Do.	Lambs	A. Murray	...	...	5·00	...	...	...	15·00	15·00	...	...	10 0 0
Do. (B Grade)	Swan	Binney & Son, Ltd.	...	...	6·00	...	...	...	12·00	12·00	...	...	9 10 0
Do. (A Grade)	do.	do. do.	...	...	7·00	...	...	...	15·00	15·00	...	...	12 10 0
Do.	K.B.M.	G. Bates	...	...	5·00	...	...	...	9·00	9·00	...	...	8 10 0
Do.	Eclipse	W.A. Meat Exports Co.	...	...	6·00	...	...	...	12·00	12·00	...	...	8 15 0
Do.	Crown	Perth Ice and Cool Storage, Ltd.	...	...	5·60	...	...	...	14·00	14·00	...	...	10 0 0
Do.	Apollo	J. Kitchen & Sons	...	...	5·25	...	...	3·00	12·00	15·00	...	...	9 10 0
Do.	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	5·50	...	...	...	14·00	14·00	...	...	9 15 0
Do.	A1	Haynes & Clements	...	...	5·25	...	...	3·00	9·00	12·00	...	...	9 10 0
Do.	Wyndham	Wyndham Freezing, Canning, and Meat Exports Works	...	...	6·00	...	...	8·50	7·75	16·25	...	...	9 5 0
Do.	A.N.A. Surprise ...	C. A. Kirkby & Sons	...	...	5·00	...	...	4·00	10·00	14·00	...	...	9 15 0
Do.	C.S.M.L.	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	6·00	...	...	...	12·00	12·00	...	...	10 0 0
Do.	ML in diamond ...	do. do.	...	...	6·00	...	...	...	12·00	12·00	...	...	10 0 0
Do.	Sickle	do. do.	...	...	6·00	...	...	...	12·00	12·00	...	...	10 0 0

* Manganese, 5·75%. † Nitrogen as ammonia and nitrate.

FERTILISERS—*continued.*

Name of Fertiliser.	Brand.	By whom Registered	Nitrogen (N) as:				Phosphoric Acid (P_2O_5) as:				Potash (K_2O) as:		Price per ton on rails at Works or Perth.
			Nitrate.	Ammonia.	Blood & Bone.	Bone-dust.	Water Soluble.	Citrate Soluble.	Acid Soluble.	Total.	Sulphate.	Muriate.	
(b) Bones.			%	%	%	%	%	%	%	%	%	%	£ s. d.
Bonedust	Lambs	A. Murray	...	...	...	3·50	...	...	22·00	22·00	...	...	11 0 0
Do. (Standard) ...	Swan	Binney & Son, Ltd.	...	...	...	2·75	...	...	18·00	18·00	...	...	9 10 0
Do. (Special No. 1) ...	do.	do. do.	...	...	...	3·50	...	...	22·00	22·00	...	...	10 10 0
Do.	K.B.M.	G. Bates	...	...	...	3·00	...	...	18·00	18·00	...	...	7 10 0
Do.	Eclipse	W.A. Meat Exports Co., Ltd.	...	...	...	3·50	...	...	22·00	22·00	...	...	7 10 0
Do.	Crown	Perth Ice & Cool Storage, Ltd.	...	...	...	2·75	...	...	18·00	18·00	...	...	10 0 0
Do. (Pure)	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	...	...	3·50	...	...	22·00	22·00	...	...	10 15 0
Do.	W in diamond ...	Henry Wills & Co., Ltd.	...	...	...	2·75	...	6·00	13·00	19·00	...	...	‡9 0 0
Do.	C.S.M.L.	Cuming Smith Mt. Lyell F.F., Ltd.	...	...	...	3·50	...	...	22·00	22·00	...	...	11 0 0
(c) Other.													
Fish Fertiliser	Swan	Binney & Son, Ltd.	...	...	4·50	...	...	...	12·00	12·00	...	...	12 0 0
Animal Fertiliser	K.B.M.	B. Bates	...	...	3·00	...	...	...	12·00	12·00	...	...	6 10 0
C.—MINERAL AND ORGANIC.													
The Better Fertiliser ...	Venus	Nedlands Lawn & Garden Co.	...	†4·30	...	...	12·60	...	3·70	16·30	...	...	20 0 0
Bone Super Potash	Swan	Binney & Son, Ltd.	...	1·10	...	...	...	...	14·25	14·25	...	1·20	5 10 0
Potato Fertiliser (Special) ...	do.	do. do.	...	†3·50	...	...	14·00	...	1·00	15·00	...	8·00	9 5 0
Do. (Bone basis)	do.	do. do.	...	†3·00	...	...	...	...	15·00	15·00	...	2·25	9 10 0
Do. (X) ...	do.	do. do.	...	†3·20	...	...	...	...	11·00	11·00	...	...	7 7 6
Bone and Super	do.	do. do.	...	1·37	...	...	8·00	...	9·65	17·65	...	...	6 0 0
Orchard Fertiliser (Bone basis)	do.	do. do.	..	†3·17	...	...	...	...	10·00	10·00	...	5·00	11 0 0
Domestic Garden No. 1 ...	Wondergrowth .	W. J. Mathews ...	...	†3·75	...	..	12·00	·30	3·20	15·50	...	...	‖
Bone, Super and Potash ...	Cresco	Cresco Fertilisers (W.A.), Ltd.	...	1·00	...	...	...	...	14·00	14·00	1·00	...	4 17 6
Bone and Super	C.S.M.L.	Cuming Smith Mt. Lyell F.F., Ltd.	...	2·00	...	...	13·00	·80	4·70	18·50	...	...	7 0 0
Do.	ML in diamond ...	do. do.	...	2·00	...	...	13·00	·80	4·70	18·50	...	...	7 0 0
Do.	Sickle	do. do.	...	2·00	...	...	13·00	·80	4·70	18·50	...	...	7 0 0

† Nitrogen as Ammonia and Blood and Bone. ‡ On rails, Albany. ‖ Sold in small lots.

FIRST EARLY ("DWALGANUP") SUBTERRANEAN CLOVER. NOTES ON ESTABLISHMENT.

T. C. Dunne, Muresk Agricultural College.

No more suitable pasture species for the areas having a rainfall of 16-25 inches per annum has been yet found than First Early ("Dwalganup") Subterranean Clover. The plant meets many requirements in that not only has it been successful for grazing but it allows hay and silage of excellent quality to be conserved. This is of great importance in providing for sheep a summer feed which is not only a concentrate but which is relatively inexpensive. The large amount of seed formed underground in burrs forms another nutritious food reserve. Under favourable conditions, even when a hay crop has been taken off, some hundreds of pounds of seeds per acre may be found under an established sward. The burrs containing the seed can easily be brought to the surface with a cultivator or scarifier, when they will be readily eaten by sheep. The clover is further recommended by virtue of its value as a soil renovator and its inclusion as a unit in crop rotation in the areas mentioned will undoubtedly result in the production of better cereal crops. Its utilisation for this purpose has already been recommended.*

It is confidently expected that there will be a large increase in the areas sown to this clover for sheep farming. A publication dealing with subterranean clover generally is already available,† but for those without previous experience with the early strain some directions for establishment are given.

Seed and Strain.

In procuring seed for areas under review, only First Early ("Dwalganup") Subterranean Clover should be considered. This is the earliest flowering strain at present available and the only one with which success can be assured with a rainfall of less than 25 inches per annum. Many farmers in previous years have made efforts to introduce subterranean clover but their attempts have been nullified by the wrong strain of seed having been sown. At Muresk this early strain flowers about the second week in August and seed is formed while the soil is still moist enough for the burrs to be buried. For maintenance and improvement of the pasture it is essential that the clover be able to bury the seed.

So important has the question of securing the correct strain become that the Department of Agriculture has this year introduced a system of certification for the First Early ("Dwalganup") strain and prospective buyers should insist on obtaining certified seed.

Where to Sow.

One of the advantages of subterranean clover lies in its ability to thrive on soils which have been depleted of fertility by cropping. Not only does it thrive under these conditions but it renews the fertility of such areas. When selecting areas for sowing it is best to begin on paddocks which show the need of an extended period of rest before reverting to cereal cropping. Less competition from other plant species will be experienced and a good sward of clover will soon be established.

The clover does well on a variety of soils. Particularly satisfactory results are secured on light sandy soils which are often not productive with other crops. Excellent results are also secured on heavier soils, particularly where the rainfall is good. Where the rainfall is lower, *i.e.*, approximating 16 inches per annum it will

* This Journal, Vol. XI. (2nd Series), No. 2, June, 1934, pages 254-260. (Reprinted in Leaflet 414.)

† This Journal, Vol. X. (2nd Series), No. 1, March, 1933, pages 40-48. (Reprinted in Leaflet 225.)

probably be best to begin on the lighter soils as there is a possibility of the surface of the heavier soil becoming hard before the seed can be buried. On the other hand, it may be possible to obtain good results on sandy soils with an annual rainfall of less than 16 inches.

Time of Sowing.

Seed of subterranean clover should not be sown in dry soil as there is danger of germination with a light shower and subsequent dying of the young seedlings should a dry spell follow. It is necessary to await the arrival of the reliable winter rains which normally occur early in May. This will allow plenty of time for satisfactory first year growth and seed formation.

Rate of Seeding.

Seed production by this clover is so prolific that it is more economical to sow the seed lightly and let it multiply in the field than to sow heavily enough for a complete cover in the first year. A rate of 2 lbs. per acre of clover seed when sown with a cover crop is quite satisfactory and experiments in progress indicate that 4 lbs. per acre under these conditions is about the maximum for economical establishment. A sowing of 1 lb. per acre may sometimes be sufficient to introduce the plant where a cover crop is sown but it will take somewhat longer for the clover to spread and completely cover the ground. It must be emphasised that an excellent germination must be obtained for this light rate of seeding to give satisfactory results. Where no cover crop is sown it is advisable to sow more heavily in order to get a certain amount of feed in the first year but the initial outlay becomes high if a large area is to be treated.

By nature, subterranean clover has a fairly high percentage of hard seeds, *i.e.*, seeds which do not germinate during the first season but will germinate in later years. In the process of extracting the seed from the burrs, however, most of the seed is scratched and the percentage germination is considerably increased.

While it is not advisable to buy clover burr for fear of introducing insect and plant pests, it is a good practice to collect burr from any area on the farm already under subterranean clover and thus to sow other areas. The percentage germination of this unscratched seed would be fairly low and a heavier seeding would be necessary. At least enough burr to give about 8 lbs. of seed per acre should be distributed. Good clean burr which is free from stems, stones and small sticks should give about one-quarter of its weight as clean seed. When raking for burr, the sample obtained may contain, if not cleaned, only about one-tenth of its weight as clean seed.

Methods of Seeding.

Covering the seed of subterranean clover with soil, while not absolutely essential, usually results in better germination. The best depth is about ½ inch and 1 inch is about the maximum depth.

The clover may be successfully established with or without a cover crop. Sowing with a cover crop such as oats which is to be harvested for hay or grain and which is not sown too thickly, has much to recommend it, in that the clover is protected from grazing and it will multiply considerably during the first year without any loss of time.

When a cover crop is used it is safest to make the sowing of the clover seed a separate operation following the sowing of the main crop. It may be broadcasted by hand or put through a broadcaster (a drill with the hoes removed will serve admirably). The seed may then be covered by following with a light harrow or if sown through a broadcaster a chain dragged behind will usually give enough covering.

In order to spread the small amount of seed evenly it should be mixed with sand or, if this is not easily available, with superphosphate. If superphosphate is used, however, it should be mixed with the seed immediately before sowing, as if left in contact with the seed for any length of time it has a detrimental effect on germination.

Satisfactory germination has been secured in some instances by mixing the seed with the superphosphate and sowing through the drill with the cover crop. Failures, however, have been recorded, presumably through the seed being buried too deeply. Broadcasting the seed separately is recommended as being the safer method to adopt.

Where no cover crop is used, some effort to provide a light covering of soil for the seed should be well repaid by better germination. This is especially the case on lighter soils or where the soil is quite devoid of any material such as dead grass which would help the seedlings to take hold. A light harrowing should be given before sowing and covering provided as suggested above.

When clover burr is used, there does not appear to be the necessity for providing a covering of soil such as is required with clean seed. The burrs themselves tend to take hold of the soil particles and to become partly buried with the early rains. For this reason it is doubtful whether any cultivation given prior to sowing clover burr would be profitable.

Inoculation.

All plants belonging to the legume family, which includes clover, peas, beans, etc., have the ability to use atmospheric nitrogen for growth but only when the proper bacteria, which vary for different groups of plants, are present. The bacteria which are present in the soil where cluster clover, hop clover and other common clovers (but excluding burr trefoil) are growing are those needed by subterranean clover, and on such areas satisfactory results will be secured. In some cases, however, these clovers are not present and inoculation of the seed with the necessary bacteria is advisable. For this purpose bottles containing bacteria for inoculation, together with directions for use, are provided by the Department of Agriculture at a nominal cost.

Seed so inoculated must not be mixed with superphosphate for purposes of sowing as the fertiliser has the effect of quickly killing the bacteria. Slightly moistened sand should be used as a distributing agent.

Fertiliser.

Fertiliser, in the form of superphosphate, is essential to the success of subterranean clover. The superphosphate should be applied at the time of seeding and thereafter each autumn. When the pasture is established the best time for application is with the advent of the first reliable rains. However, a heavy cereal cropping programme often prevents much attention to pastures at this time so that it may be necessary in many cases to apply the superphosphate earlier in the season on the dry land. An annual dressing of 90-112 lbs. per acre will give satisfactory returns.

Management.

The use of a cover crop almost obviates the need for careful management, especially if the crop is not grazed. By the time the crop is removed the clover has matured and the seeds for the following year's stand are buried. Allowing formation and burying of as much seed as possible in the first year is an important factor in successful establishment.

More care is needed where no cover crop is used. The paddocks should not be grazed until some lateral development of the young clover plants has taken place. Again, at the time of seeding, stock should be kept away until the seeds have been buried. Subterranean clover, when dry, provides good feed, and grazing at this stage can have no detrimental effect on the subsequent pasture.

General.

Prospective growers are warned against expecting too much from early subterranean clover in the first year. At the rate of seeding suggested, only a thin stand is produced and the plants are characterised by long runners and scanty foliage. At this stage it appears rather unattractive. It must be remembered, however, that this habit of growth enables the clover to spread and eventually cover the ground. A vigorous plant in the open may have a number of runners up to three feet in length radiating from the centre. Burrs containing three or four seeds may be formed about every three inches along the stems. Such a plant could easily produce over one hundred seeds for the thickening of the stand the following year. When the stand becomes thick, the plants are forced into more upright growth and a mat of leafy pasture is obtained in the second or third year.

References.

Leaflet No. 225: Subterranean Clover—C. A. Gardner and T. C. Dunne. Reprint from "Journal of Department of Agriculture," Vol. 10, No. 1, March, 1933.

Leaflet No. 414: A Modified Rotation for the Wheat Belt—T. C. Dunne and F. L. Shier. Reprint from "Journal of Department of Agriculture," Vol. II., No. 2, June, 1934.

THRIPS IMAGINIS (BAG).

L. J. NEWMAN, F.R.E.S.,
Government Entomologist.

The past autumn provided a curious set of conditions in regard to rainfall and its effect upon the incidence of thrip. In the fruit-growing areas situated between Gingin and south to Pinjarra and thence south-eastward to Mt. Barker and Albany, including the central Darling Range and Avon Valley, very unusual and heavy rains fell during March and April. In contrast to this, in the areas from Pinjarra south and including the large fruit-growing districts of Donnybrook and Bridgetown, these unusually heavy rains were not experienced. All areas received the normal winter rains with a cool changeable spring, the summer being somewhat belated. These conditions of varying autumn rains were watched to determine whether either was more favourable to thrips. It was suggested by some authorities that there was a serious possibility of a spring plague of *thrips imaginis* following a wet autumn.

We have witnesssd occasional plagues of *thrips imaginis* during autumn, but this did not take place last autumn in any of our fruit-growing districts. The autumn and spring roses this past year were exceptionally fine in every way and free from thrip damage. Following the March rains, the weather remained on the cool side and the spring and early summer were also cool and cloudy. Winter observations did not indicate any increase in numbers of over-wintering thrips above that of previous winter periods.

Every winter, the native and introduced wattles support sufficient over-wintering thrips to insure an active and vigorous reproduction of the pest as soon as the weather becomes sufficiently warm and fine. If the weather in August should prove favourable to the increase of thrips then trouble can be expected from this source in the second spring generation, which if the weather is suitable will swarm in October. If this increase in August-September does not take place, owing to unfavourable meteorological conditions, then the apple blossom is safe. Swarms may make an appearance later, but too late to affect the fruit crop. It would seem that we have a potential plague of thrips every year, should all the necessary factors synchronise. Fortunately the necessary combination of factors to produce a plague only occurs at intervals of several years. It is estimated the apple crop this season will probably be the heaviest yet recorded in this State.

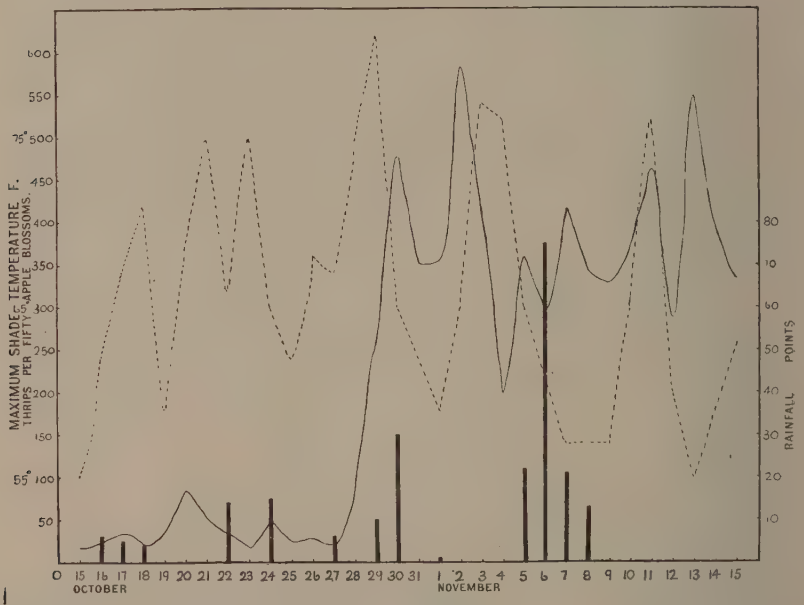
During the past spring, Mr. Ross Wallace, of Mt. Barker, Western Australia, rendered valuable assistance by undertaking to record the number of thrips per day, found in 50 blossoms of Cape weed and of apple, during the period 15th October to 15th November, 1934, also to note and report upon the general weather conditions experienced at the time of the observations, which are as follows:—

Weather observations, 15th October to 15th November, 1934.

Wind.	Type of Day.
Light S.W.	Cloudy, interspersed with sunshine and light showers of rain.
Very light S.S.E.	Cloudy. Light shower in afternoon.
W. to N.W.	Cloudy and warm.
S.W.	Sunshine and clouds, but colder.
Very light N.W.	Cloudy, warm and muggy.
N.W. to S.W.	Bright, warm day.
S.W., fairly strong and squally	Overcast and raining. Cold night.
N.W.	Clouds and sunshine. Cold night.
N.W.	Overcast, sunshine and rain.
S.W.	Clouds and sunshine.
S.W., fairly strong	Clouds and sunshine, warm, muggy, rain overnight.
S.W. to N.W., medium ..	Overcast, sunshine, rain.
N.W.	Overcast, with sunshine.
Hot N.E. to N.	Clouds and sunshine, muggy, change advancing. Rain at night.
S.W. to N.W., in gusts ..	Overcast, raining, and a little sunshine.
S.W., light	Rain, overcast (little sunshine). Cold night.
S. to S.W.	Overcast and raining. Cold night.
S.E., light	Overcast, sunlight, and humid.
S.E.	Bright sunshine.
S.W. to N.W.	Overcast, humid, and rain approaching. Rain at 5.30 p.m.
S. to S.W.	Raining, sunshine, heavy rain.
S.W.	Fine, sunshine. Raining. Heavy rain towards night.
S.W., squally	Rain and high winds. Cold night.
S.W., squally	Rain and squally winds.
S.E.	Sunshine and clouds. Cold night.
S.W. to S.	Sunshine and clouds. Cold night.
S.E. to E., light	Sunshine and clouds. Warming up.
S.W. to S., fairly strong ..	Rain clouds and sunshine, overcast.
S.W. to S., cold wind ..	Overcast all day and cold night.
S.E. to S.	Overcast, warming, and cold night.
S.E.	Overcast and warm, rain at night.
S.E., moderate	Overcast and rain. Slight showers in morning.

The maximum daily temperature and the rainfall for the period have been kindly supplied by the State Meteorologist. From the data so obtained a graph has been drawn by Mr. Jenkins of this branch, which records the temperature, rainfall, and number of thrips per 50 apple blossoms.

A perusal of this graph shows that the highest temperature recorded was 81 degrees, Fahrenheit, on the 29th October. This was followed by an immediate rapid increase in the thrips population. It will also be seen that there were not protracted periods of mild or warm weather, but whenever two or three consecutive



EXPLANATION OF GRAPH:—Dotted line indicates rise and fall of temperature; Plain line indicates rise and fall of thrips; Block lines indicate rainfall.

warm days did occur there is shown a corresponding rise in the thrips graph line. The apparent discrepancy between the temperature and thrip numbers as shown in the last week of the observation, appears to be connected with the fact that previously comparatively warm temperatures, accompanied by rain, had been experienced, thus rendering the soil warm and humid and favourable to the emergence of thrips. At no period did the number of thrips per apple blossom exceed 12. The average per flower was 4.5. During past plagues of this pest, we have observed that unless the number of thrips per blossom exceeded 20, very little damage was caused. It has again been demonstrated that the factors which control the swarming of the thrips are meteorological, and if these are unfavourable during October-November, even though there may have been a good winter carry-over of thrips and an active swarm in August, thrips will not prove a serious pest.

WILD RADISH.

A SIMPLE METHOD OF ELIMINATION FROM SEED BARLEY.

G. R. W. Meadly, B.Sc.,
Agricultural Adviser, Department of Agriculture.

One of the most difficult tasks which confronts a seed producer is the separation from a particular line of seed other seeds having approximately the same size, shape and weight. There are frequent cases of weed seed impurities which are similar in size to commercial seeds, but produce objectionable and sometimes poisonous plants. Examples often encountered are Sorrel (*Rumex Acetosella*) in Drooping Flowered Clover (*Trifolium cernuum*); Guildford Grass (*Romulea rosea*) in Subterranean Clover (*Trifolium subterraneun*) and the case to be considered, Wild Radish (*Raphanus raphanistrum*) in barley (*Hordeum vulgare*).

Wild Radish is a common and troublesome annual weed on cultivated land and has been declared a noxious weed in a number of road board districts. It is also listed as a noxious weed under the Agricultural Seeds Act.

Most members of the cabbage family (*Cruciferae*), to which the Wild Radish belongs, have pods which open longitudinally thus liberating the seeds. This feature is typically exampled in Wild Turnip (*Brassica Tournefortii*) and the mustards (*Sisymbrium spp*). In the case of Wild Radish, however, the pod breaks transversely into one or more seeded segments, the seeds remaining enclosed within sections of the pod. These sections are comparable in size with wheat, oats, barley, etc., and when contained in bulk lines of these seeds, are difficult to eliminate by means of grading or winnowing. As it is contravening the Agricultural Seeds Act to sell seed containing Wild Radish the presence of this impurity must be regarded with concern.

Recently a firm desired to distribute seed barley, but found difficulty in eliminating Wild Radish. Owing to the difference of density between the two "seeds" it was decided to attempt separation by flotation and an experiment was carried out with this object in view. A quantity of the affected barley was poured into a dish of water and after stirring, the entire Wild Radish content floated to the surface and the barley remained on the bottom of the basin. As the interested firm had intimated that if bulk samples were treated the immersion would occupy ½ to ¾ hour, samples were taken at the end of 30 and 45 minutes immersion. All the Wild Radish was then still floating.

The samples were then dried in the draught from an electric fan, the seed being stirred from time to time until completely dry. After two days' storage, a germination test was commenced on the treated seed, along with the original sample as a check, with the following results:—

Time immersed.	Germination.
0 mins.	98%
30 „	100%
45 „	98%

Thus, allowing for experimental error, no detrimental effect was produced in germination by the immersion followed by complete drying.

Following on these experiments by the Department, the firm treated five tons of barley in large tanks, the radish rising to the surface and being skimmed off.

After immersion, the seed was spread on floors to a depth of about 6 inches and a current of air drawn through. The seed was continually stirred until thoroughly dry, and on examination showed no signs of the Wild Radish. A germination test conducted on the bulk lot gave a figure of 98 per cent.

This method would probably be satisfactory in eliminating Wild Radish from seed wheat and oats, but thorough drying after immersion is essential.

FUMIGATION OF PEA WEEVIL.

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By L. J. Newman, Government Entomologist.

Complaints have been received by the Department to the effect that fumigation with carbon-bi-sulphide at the rate of 4 lbs. per 1,000 cubic feet of space is not giving a satisfactory kill of this weevil. In fumigation there are several important factors which have to be considered.

Successful gas treatment can only be accomplished when the bins, rooms or other vessels used are completely gas tight. If there is any leakage, due allowances must be made and additional quantities of the fumigant used. Should the depth of peas in any given room or vessel exceed 5 feet, it is advisable to insert a pipe or tube and by this medium pour in a quantity of the fumigant, the balance being applied to the top of the mass, thus insuring complete penetration.

Temperature is also very important. The higher the temperature when the fumigant is applied, the more rapidly is the gas evolved.

Experiment has shown that the larvae and adult weevil can be definitely destroyed inside the peas by fumigation with carbon-bi-sulphide. The pupa stage, however, is considerably more resistant and in some instances might survive the treatment and later emerge as weevils. This probably accounts for the presence of a few live weevils in peas that have been fumigated as soon as harvested.

If seed is kept in bags securely closed against the escape of weevils, it may be fumigated later or at any time before sowing. The chief reason for fumigating the peas as soon as possible after harvesting is that so many growers make no provision to prevent the escape of the weevils, the peas being placed in any old shed. Every grower of peas should definitely abstain from sowing any seed which contains living weevils, or has been damaged by weevil, as this is a fruitful means of spreading the trouble.

There is also the proven fact, that weevily seed gives poor germination and is only worth about one-quarter as much as sound seed. Some of the weevil-infested seeds germinate but a large proportion give weakly plants, with resultant poor yield.

The pea weevil is an introduced pest and has no native host plants, being confined to the true peas belonging to the genus *Pisum*, which includes field and garden peas. This fact renders the control considerably easier than if other native host plants existed.

If all growers would definitely combine and see that all pea seed was thoroughly treated as advised and the sowing made as early as possible to get the crop to ripen early a great deal will have been done towards reducing the numbers of this insect.

CODLIN MOTH.

Geo. W. Wickens,
Superintendent of Horticulture.

T.M.R.

Apple and pear growers throughout the State will be disturbed by the news that Codlin Moth has again made its appearance in Western Australia, but will be relieved to know that so far as our investigations have progressed up to the present—1st March—the infection is confined to a very small area, comprising three semi-commercial orchards at Ewington, the total acreage of which is under ten. The pest quite evidently started this season in Mr. Clayton's orchard near his house, and spread outwards from there to two adjoining places, but the degree of infection decreases rapidly as the distance from the centre increases. So far we have not seen one apple or pear with codlin larvae inside, the caterpillars having left the fruit to hibernate in the trunks and branches of the trees. An intensive search is being made for the resting larvae, and an excellent kill has been recorded, while as an extra precaution each tree trunk in the infected area is being banded with prepared material which it is claimed will destroy any larvae hibernating therein.

The work of searching, not only the trunks but all crevices in the bark on the limbs of the trees, is slow and tedious, but the fact that we have actually destroyed 300 larvae is evidence that the labour expended is quite worth while.

A very thorough search is being made of all apple and pear trees in the Collie district, and if the infected area proves to be as small as we believe it to be, I have no doubt whatever that this outbreak will be stamped out as all others have been, but a good deal of work will be entailed in the spring and early summer treatment next season. Mr. Clayton certainly did a major service to the industry when he advised the Department of the appearance of the pest immediately he made the discovery, for if it had secured one clear season's run the work of eradication would have been increased one hundred fold. I trust his excellent example will be followed by all growers who may have the misfortune to be placed in similar circumstances.

FUMIGATION.

AN AID TO RABBIT EXTERMINATION.

A. Arnold,
Chief Inspector of Rabbits, Department of Agriculture.

The fumigation of rabbit warrens is one of the recognised effective means which may be adopted in keeping the pest in subjection, but it can never be looked upon as sufficient when employed alone, except in cases where the land is wholly cleared or on which there is no cover. If rabbits are on such land there must, of necessity, be burrows, as the rabbit cannot live without cover of some kind. Therefore, to protect himself from natural enemies, he is forced to go underground, and is then easily dealt with in traps of his own forming by fumigating the warrens with a poisonous gas. There are, however, very many holdings where, if fumigation alone were employed, very little headway would be made in checking the pest; not ten per cent. would be affected by fumigation, because

in such cases most of the rabbits are not living in burrows but in hollow logs, in rocky outcrops and other forms of cover, and in such places poisoning should always be undertaken in conjunction with any fumigation that is done. All known recommended methods need to be employed to get maximum results.

In districts where rabbits are newly making their presence felt, there are those who flatly refuse to lay poison. If the pest can be dealt with by any other method, such persons should be allowed to do their best, but if their efforts are not effective on no account should their properties be allowed to become a menace to the district and to their neighbours who have adopted all methods with success.

In large open cleared areas, such as obtain in parts of the Eastern wheat belt, fumigation alone might yield good results, but along the Avon Valley or any other part of the State in which there are many small cleared areas, with timber and scrub-covered hill tops and granite outcrops affording abundant cover, fumigation is not the best method to adopt.

Of course, there will always be a difference of opinion as to which is the best type of fumigating machine or material to use. Every maker deems his own machine effective and naturally thinks it the best, or perhaps the cheapest to operate. All machines will give results; some, however, are much more satisfactory than others. Experience has proved that those machines that give off a definitely poisonous gas are the most reliable, and because of this, chemical fumigators have largely taken the place of many of the older types which were not so sure in their action. Unless a machine generates a gas of a poisonous nature it cannot be honestly recommended. Many machines using fire are effective in the smaller and shallower type of burrows, and here death may be due to either excessive heat or suffocation, but in a short space of time both the heat and the suffocating features cease; but not so, however, with the deadly poisonous gas, and anything coming into its presence must succumb.

Of the chemical fumes, those given off from carbon-bisulphide, and from the various calcium cyanide preparations, are deadly and can always be recommended as sure.

Of the fumes generated by fire, carbon monoxide is the most deadly, and charcoal burning machines, which more readily generate this gas are the best, but conditions must be just right in order to generate the monoxide. Appliances generating smoke, and using sulphur, saltpetre, and other preparations to increase effectiveness are not consistently successful and therefore cannot be recommended, as the majority of them fail in the large and deep warrens. With every machine a great deal depends on the human element, and a brief review of the action of the various methods and gases will enable users to apply any method intelligently.

Carbon-bisulphide gives off a gas which is two and a half times heavier than air, and when pumped into burrows the gas naturally sinks to the lower levels and every corner of the warren. On this account it is eminently suitable for fumigating and especially so for fumigating deep burrows. When the inmates of a burrow are disturbed by fumigating operations, etc., they naturally go to the lowermost portions, and being frightened, remain there for a considerable time, thus the heavy carbon-bisulphide gas sinks and reaches them before they have time to recover from their fright. A further advantage of carbon-bisulphide is that being heavier than the atmosphere, it remains below, and should the warrens be opened up from the outside it does not readily escape as lighter gases would. Care needs to be exercised that sufficient gas is pumped in, otherwise only the lowest levels

will effectively be poisoned. From various reports, the non-success with carbon-bisulphide is found to be due to insufficient gas being applied. A simple method of ascertaining whether sufficient gas has been applied is to smell at the various openings. If the gas is rising it is obvious that it has displaced the air and the burrow is full of gas. A warren of, say, fifteen openings will require ten to fifteen minutes' treatment As the fumes are highly explosive, smoking or striking matches should be strictly avoided.

Cyanide for fumigation purposes is put up in various forms. One firm prepares it in dust form, another in briquettes, and it is blown through the warrens by machines. The resultant gas is known as hydro-cyanic-acid gas, and is extremely deadly to all animate life. On this account it is wise to keep on the windward side when using it. The gas is lighter than air, and therefore, tends to remain in the upper tunnels, and is given off more readily when in contact with moist earth than when in a dry state. When blown into a burrow, being light, it naturally follows the line of least resistance and is forced along the higher levels and does not so readily reach the lower levels as is the case with carbon-bisulphide. Because the gases as given off keep to the upper levels, it is absolutely essential that each opening should be tightly rammed when being filled in. If this is not done the gas will escape. This applies to all lighter than air gases.

When digging out burrows fumigated with this gas, the dead rabbits are invariably found near the surface, which goes to show that the poisonous fumes do not reach the lower levels, but that the rabbits on recovering from their fright have come up from the lower levels into the cavities where the gas has remained, and have there succumbed.

Many, however, may have remained in the lower levels and if the burrow is opened up from the outside the gas will escape, as also will the live rabbits that are inside. Even if the burrows are not opened, live rabbits in dead ends may dig their way out and so avoid passing through the gas-filled channels.

Of the fumes generated by fire, carbon monoxide is the most deadly, but unless the conditions are right, monoxide will not be produced. In order to produce carbon monoxide from charcoal, a compact mass og glowing coal through which the air is drawn is essential.

There are one or two very good machines on the market that are giving good results when instructions are implicitly followed, but if leaves, roots, etc., are used instead of charcoal, they will not give off the necessary poisonous gas. These machines naturally are not quite so handy for moving about as the chemical machines, but they have this advantage in that the first cost is practically the only one. Charcoal can be readily obtained on any farm, whereas chemicals cost a considerable sum. The exhaust fumes from a motor car, truck, etc., give off a proportion of monoxide gas, but the use of motor cars or trucks for fumigating rabbit warrens is not an economical proposition: it is like employing an 18-pounder with which to shoot a sparrow.

With machines burning leaves and rubbish, sulphur and other chemicals are sometimes added to make them more effective. As the fumes are pumped in hot they naturally remain in the upper levels and there is a risk that insufficient dioxide will be generated to reach the lower levels and be effective in deep burrows. The use of this type of machine has been found successful in the shallow type of warren and death may be due either to suffocation or to the high temperature produced. One point to remember with this class of machine is that in order to achieve success the fumes must be pumped into a burrow for a considerable time.

If pumping is only conducted for a few minutes many of the burrows if opened next day will be found to contain live rabbits, even though treated for fifteen or twenty minutes. Powders are also supplied by some manufacturers for use with their machines. They are comprised of arsenic or such like materials for generating a poisonous gas. These gases are also effective but generally of the lighter than air variety, and the powder preparations so essential to their success are a continual source of expense.

There are a number of smoke machines on the market. The smoke itself will not kill readily, but even if the smoke is not effective the pumping of hot air into a small space, if continued long enough, will have the desired effect, at any rate in comparatively small and shallow burrows.

Generally speaking, smoke appliances are not much in vogue to-day. They have given place to the surer and generally more economical (judged by results) types of chemical fumigators, or those that are known to give off definite poisonous gases.

I would again stress the fact that fumigation is only effective as a method of destruction where there are plenty of burrows and warrens. In this State with its sparsely cleared areas affording abundance of cover, rabbits are not all in burrows. In many districts rabbits are plentiful, yet a warren is rarely seen. Consequently, in conjunction with fumigation, poisoning should always be undertaken. This point cannot be stressed too strongly because even when conditions are highly favourable for fumigation there will still be a large percentage above ground for which poison should be laid.

SKELETON WEED.

(*Chondrilla juncea*, Linn.)

C. A. GARDNER,
Government Botanist.

The spread of skeleton weed in parts of New South Wales is causing anxiety in that State, and frequent references to the plant have been made in the Press during the last few weeks. Fortunately the weed is not officially known to occur in Western Australia, but should it appear in our wheat lands, the weed will prove a problem. The purpose of this short article is to impart some information regarding the weed, and to enable farmers to recognise the plant, so that it can be promptly dealt with if it should appear. The effective control of any weed depends primarily upon its early recognition and prompt attention.

Skeleton weed is native to Europe and the Asiatic side of the Mediterranean, especially Palestine. The first record of its appearance in Australia was made by J. H. Maiden, Government Botanist of New South Wales, who recorded it in the Agricultural Gazette of New South Wales in 1918, from specimens received from Mr. E. Field of Wave Hill, Marrar, Western New South Wales in 1916. Apparently the weed is at present confined to the State of New South Wales, but there is every possibility that it will eventually spread to other centres, and this possibility should be borne in mind, and a careful watch kept for the plant.

The habit of skeleton weed is such that it will withstand very heavy grazing by sheep and frequent cultivation. The root-stock branches, so that the plant spreads vegetatively, in addition to spreading by means of its numerous wind-distributed seeds. It is perennial; the aerial parts—*i.e.,* those above the soil—die back annually, but the stock remains alive, sending up fresh growths each winter. Cultivation does not suppress it, since new shoots are sent up from the severed stock, and it is stated that ploughing to a depth of four or five inches is ineffective in destroying the plant. Summer cultivations likewise only destroy the top growth, and do not kill the plant, which shoots again. The long stems grow rapidly, choking out cereal crops, and interfering with harvesting operations. It is interesting to note that the plant has much the same habit of growth as wild turnip -long branching apparently leafless stems. The weed, in addition to seed production, is largely spread through cultivation, since harrowing and ploughing only serve to cut or break off the stock, transplanting the portions elsewhere, while the parent root is unaffected by these operations. This parent stock branches repeatedly under the soil, producing in time large clumps of shoots, each of which may develop into individual plants through transplantation by cultivation. Mr. E. S. Clayton, in the Agricultural Gazette of New South Wales (September, 1927), states that there are cases on record in which plants have been dug out to a depth of twelve inches, and have grown again from below.

The control of the weed thus presents many problems, the principal one being to secure some means of destruction which will affect the entire rooting system. It is not proposed to deal here with control measures since the weed is not present in Western Australia, but it may suffice to say that the problem of control is one which is proving difficult. If the weed should appear locally, it will have to be dealt with immediately.

DESCRIPTION OF THE PLANT.

*Chondrilla juncea,** Linn. Sp. Pl. 796 (1753).

From* *χονδρος*—granular, coarse, *e.g.,* coarse salt, probably in reference to the roughened appearance of the upper portion of the achene ("seed"); *juncea,* rush-like, in reference to the bare erect stems.

A perennial herb with one to several erect, smooth or striate simple, or more commonly branched stems attaining a height of from 12 to 24 inches or more, arising from a simple or branched summit of a deeply penetrating tap-root of up to 2 feet in length. Leaves mostly radical, with small bract-like stem-leaves situated below the branches of the aerial stems. Radical leaves narrow, lyrate-runcinate, scabrous-pubescent and ciliate, 2-3 inches in length in the specimen seen, spreading in a rosette on the soil. Stem leaves simple, linear or linear-lanceolate, glabrous, acute, with a prominent midrib, arranged along the ultimate branches of the inflorescence and subtending the branches and branchlets. Flower-heads mostly terminal and solitary, with sometimes the addition of one or two apparently sessile heads on the ultimate branches. Involucre cylindrical, the bracts in two series, the erect inner linear acute and herbaceous bracts surrounded by a few short outer subulate bracts less than one-quarter the length of the involucre. Receptacle naked, flat. Florets few (8-12 ?), all ligulate, yellow, much exceeding the involucre, the obtuse apices shortly 5-toothed. Stamens 5, the anthers united, sagittate at the base, the auricles setaceous-acuminate. Style branches slender, subterete. Achenes cylindrical-clavate, subterete, obtusely ribbed, and muricate in the

upper portion by scale-like projections upon the ribbed surface, abruptly constricted into a short neck below the beak with five fused scales resembling a false calyx; beak slender, thread-like, usually longer than the achene, dilated at the apex into a disk bearing a pappus of numerous fine white silky simple hairs.

EXPLANATION OF PLATE.

A, Habit, showing rooting system and bases of the branches. B, Typical leaf, showing the lyrate-runcinate outline. C, branchlet, showing stem-leaves and flower-heads. D, A flower-head or capitulum, showing the two types of bracts (enlarged). E, Floret, showing the 5-toothed ligulate corolla, and the silky-hairy pappus of the undeveloped achene (enlarged). F, A typical achene, showing the slender beak surmounted by the hairy pappus. G, An achene much enlarged, showing the ribbed exterior, and the roughed upper portion with the calyx-like 5-lobed cup at the apex. Only the base of the beak is shown.

Botanic Gardens, Sydney. Icon. origin.

The plant belongs to the Tribe *Cichorieae*, with affinity to Lactuca, from which it differs in the almost terete and muricate achene. The achene also somewhat resembles that of *Taraxacum* and *Hypochoeris*.

HOW TO RECOGNISE SKELETON WEED.

The botanical description given above was made from material received from the Curator of the National Herbarium of New South Wales. The accompanying plate was made from the same material, but this being in a dried condition, the illustration may not be quite typical. The plate, together with the necessarily somewhat technical description, should enable a farmer to have some idea regarding the appearance of the weed. The plants with which it is likely to be confused locally, are wild lettuce (Lactuca), and flatweed (*Hypochoeris*). From the wild lettuce, skeleton weed may be distinguished by its practically leafless stems and much branched habit. Both, however, are rigid and wiry (almost woody) plants. Flatweed has the basal leaves of skeleton weed, but an entire absence of any stem-leaves, and the stems are thinner, quite soft and milky, while those of skeleton weed are stout and wiry.

There is a third plant of local significance (*Hedypnois cretica*) which has the habit of flatweed, and small leaves on the otherwise bare stems, but the plant is of low straggling growth—not erect as in flatweed or skeleton weed.

In consideration of the finer points involved, it will not be possible for farmers to recognise the plant with certainty, but with the aid of the accompanying notes and illustration, some idea of the plant's appearance can be gained. Any suspected plant should be forwarded immediately it flowers to the Government Botanist, when a diagnosis can be made, and immediate action taken.

FIRST EARLY (DWALGANUP) SUBTERRANEAN CLOVER. GOVERNMENT CERTIFIED SEED NOW AVAILABLE.

G. R. W. Meadly, B.Sc.,
Agricultural Adviser, Department of Agriculture.

During the last few years a considerable number of complaints have reen received by the Department concerning nondescript seed received when first early subterranean clover seed was supposedly purchased. In many cases this strain contained an appreciable quantity of mid-season strain and sometimes the mid-season was actually sold as first early.

With an idea of protecting the farmer and at the same time assisting the conscientious grower and seed merchant, the Department evolved a scheme for the certifiction of Dwalganup subterranean clover seed. This was treated rather fully in the December, 1934, issue of this Journal. (Strain Certification of Agricultural Seeds—G. R. W. Meadly).

Government certified seed is now available from the various seed merchants, and if farmers are desirous of securing this strain of seed they are definitely advised to purchase only "certified" lines. Bags containing this seed are sealed with a lead seal bearing a swan on one side and a broad arrow on the other. When bag lots are purchased these seals should be intact and the string unbroken.

DEPARTMENT OF AGRICULTURE.
Western Australia.

CERTIFIED FIRST EARLY (DWALGANUP) SUBTERRANEAN CLOVER SEED.

Grown on Registered Area No......

The Purity and Germination Certificate concerning this seed is numbered .....

Date..... .....

[*See over.*] *Inspector.*

[Copy of Label.]

[On Back.]

This Certification gives warranty as to Strain only. Details as to Purity and Germination are obtainable from the Dept. of Agriculture, Perth, on quoting the Certificate number.

The tag illustrated is attached to the outside of each bag and a slip enclosed within the bag.

Any purchaser desiring to secure purity and germination figures concerning the seed they have purchased should forward the certificate number recorded on the tag and slip of each bag to the Government Botanist, Department of Agriculture, Perth.

METEOROLOGICAL INFORMATION.

STATIONS.	TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.	
	Maximum.		Minimum.		For Month.	Average.	Maximum.		Minimum.		For Month.	Average.	Maximum.		Minimum.		For Month.	Average.
	Mean.	Highest.	Mean	Lowest.			Mean.	Highest.	Mean.	Lowest.			Mean.	Highest.	Mean.	Lowest.		
	DECEMBER, 1934.						JANUARY, 1935.						FEBRUARY, 1935.					
					inches.	inches.					inches.	inches.					inches.	inches.
Chapman State Farm	87·5	107·8	60·0	49·4	0·30	0·27	93·4	108·0	65·0	54·2	0·65	0·29	91·6	108·4	64·3	51·0	0·45	0·41
Geraldton	81·6	104·0	63·0	49·5	0·17	0·16	84·6	104·2	66·0	55·8	0·89	0·22	85·6	105·0	65·9	53·5	0·26	0·28
Walebing	87·1	105·0	57·1	45·1	0·16	0·47	92·8	111·6	61·8	50·1	0·87	0·35	89·8	109·0	61·1	44·1	0·85	0·48
Perth	79·8	102·8	60·2	50·1	0·35	0·56	85·7	106·0	63·7	55·0	0·18	0·34	84·5	106·3	63·2	49·0	0·36	0·41
Kalamunda	81·2	101·8	58·2	49·1	0·33	0·76	87·1	106·6	60·0	51·2	0·47	0·51	84·9	104·5	60·9	47·6	0·59	0·58
Bunbury	76·3	95·0	55·9	43·3	0·32	0·57	82·4	97·0	59 4	47·8	0·30	0·43	79·3	95·6	58·7	45·2	0·40	0·52
Bridgetown	81·4	99·5	49·6	38·0	1·41	0·76	88·1	107·0	54·7	37·2	0·38	0·55	85·9	105·0	50·7	38·0	0·52	0·62
Albany	71·1	89·0	55·7	49·6	2·21	1·17	73·2	88·0	58·9	52·0	0·51	0·86	73·9	89·6	58·3	50·3	1·76	0·91
Merredin State Farm	88·2	107·0	57·4	46·6	0·11	0·54	92·2	109·4	62·1	51·0	0·62	0·48	90·0	106·0	61·1	47·1	0·45	0·50
Northam	87·3	105·2	58·8	49·8	0·10	0·34	92·7	109·0	62·0	53·0	1·41	0·30	89·6	109·9	61·5	47·2	0·57	0·38
York	85·8	102·0	57·0	49·0	0·10	0·40	91·5	108·0	61·5	51·0	0·47	0·32	88·3	108·0	59·9	46·0	0·88	0·43
Narrogin State Farm	83·7	99·4	51·7	39·6	0·13	0·56	89·4	106·0	56·6	44·7	0·38	0·37	85·8	104·2	55·3	41·4	1·28	0·51
Katanning	81·7	101·0	52·2	41·0	0·29	0·62	86·9	105·0	57·2	46·3	0·42	0·38	84·1	104·6	55·5	44·0	0·82	0·53
Cape Leeuwin ...	70·1	80·0	59·3	52·2	0·97	0·82	73·2	91·5	61·9	54·0	0·26	0·65	73·5	90·2	61·9	50·0	2·03	0·80

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